

# PFAS Sampling Report

Taranaki Regional Council Groundwater Monitoring Sites, Landfills, and Wastewater Treatment Plant

# **PFAS Sampling Report**

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Client: Taranaki Regional Council

Co No.: N/A

# Prepared by

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# **Quality Information**

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Reviewed by Sean Hudgens

# **Revision History**

Pov	Rev Revision Date	Details	Authorised		
Nev			Name/Position	Signature	
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# 1.0 Introduction

This report has been prepared for Taranaki Regional Council (TRC) by AECOM New Zealand Limited (AECOM) in accordance with the proposal dated 11 July 2018. It documents sampling for per- and poly-fluoroalkyl substances (PFAS) undertaken on 6 and 7 August 2018 which comprised sampling of groundwater from selected monitoring wells around the Taranaki region, leachate from the Colson Road and Hawera landfills, and wastewater and bioboost (treated sludge) from the New Plymouth Wastewater Treatment Plant (the Sites).

The locations of the Sites are presented on Figure 1.

# 1.1 Objective

The objective of the sampling was to undertake an initial screen for the presence of PFAS in groundwater, leachate, wastewater, and bioboost at the Sites.

# 2.0 Site Information

Location details for the Sites are summarised in Table 1 below.

**Table 1 Site Information** 

Site name	Sample IDs	Site address	Map reference (NZTM)
BTW Wellington Landfarm	GND2285	Brown Road, Waitara,	E1704632 / N5683531
Dawson House	wson House GND2677		E1672439 / N5676158
Ocean View Parade	GND2740	1 Bayly Road, Port Taranaki	E1690234 / N5675937
Carrington Road	GND0508	696 Carrington Road	E1694021 / N5669859
Broadway, Stratford	GND1723	127 Broadway, Stratford	E1710600 / N5645134
Colson Road Landfill	SW01	Colson Rd, Glen Avon	E1697026 / N5676256
Hawera Landfill	SW02	Matangara Rd, Hawera	E1711333 / N5617107
New Plymouth Wastewater Treatment Plant	WW01 (effluent), WW02 (influent), BB01 (bioboost)	Rifle Range Rd, Waiwhakaiho	E1697008 / N5678332

Notes:

NZTM - New Zealand Transverse Mercator

The locations of the Sites are presented on **Figure 1**. Site cards which were provided by TRC and have further details on the site locations are included in **Appendix A**.





Map features depicted in terms of NZTM 2000 projection.

Data Sources: Cadastral Boundaries – LINZ NZ Cadastral Dataset 2018

Approved	VW	Date	27/09/2018
Checked	VW	Date	27/09/2018
Designed	SS	Date	27/09/2018
Drawn	SS	Date	27/09/2018

Α	27/09/2018	Final
Rev	Date	Description

SAMPLING LOCATIONS PLAN

# 3.0 Field Works

# 3.1 Laboratory Selection

TRC engaged AsureQuality Limited (AsureQuality) to complete PFAS analysis, at their Lower Hutt laboratory. AsureQuality is an ISO17025 accredited laboratory and was the only provider of PFAS analysis in New Zealand at the time the field works were undertaken. AsureQuality's PFAS methods comply with the Heads of Environmental Protection Authorities Australia and New Zealand (HEPA) PFAS National Environmental Management Plan, January 2018 (NEMP) and the United States Department of Defence (US DOD)/Department of Energy Quality Systems Manual for Environmental Laboratories.

# 3.2 Scope of Work

Sampling was undertaken on 6 and 7 August 2018, and included the following locations and media:

- Groundwater from the selected monitoring wells (BTW Wellington Landfarm, Dawson House, Ocean View Parade, Carrington Road, and Broadway, Stratford).
- Leachate from Colson Road and Hawera landfills.
- Wastewater influent and effluent, and bioboost from the New Plymouth Wastewater Treatment Plant (refer Figure 1 for influent and effluent sampling locations).

The sampling comprised:

- Volatile organic compounds (VOC) concentrations in the headspace of each monitoring well were measured immediately after opening each well, and were measured at each leachate sampling location, using a photo-ionisation detector (PID).
- The total well depth, depth to groundwater, and the presence/absence of light non-aqueous phase liquid (LNAPL) were gauged using an electronic oil-water interface probe in each of the monitoring wells.
- Prior to sampling, groundwater was purged from the monitoring wells using the 'low flow' method to minimise turbidity. The wells were purged for up to 15 minutes at approximate rates of 0.1 L/m, until field screening of the extracted groundwater for pH, temperature, electrical conductivity, oxidation/reduction potential, dissolved oxygen, and turbidity indicated that these parameters had stabilised<sup>1,2</sup>. Between 1.5 L and 2.0 L of groundwater was purged from each well using dedicated high density polyethylene (HDPE) and silicone tubing. Groundwater samples were then collected by pumping groundwater from approximately 0.5 m below static water level into laboratory prepared bottles. The groundwater sampling field sheets are presented in **Appendix B**.
- Prior to sampling leachate and wastewater, subsurface water from each sampling location was
  used to rinse a laboratory supplied, unpreserved subsampling bottle three times. Samples were
  then collected from the subsurface into the subsampling container using a mighty gripper, and
  transferred to laboratory prepared sample bottles. The leachate and wastewater sampling field
  sheets are presented in Appendix B.
- A sample of the bioboost was collected by hand from a bucket containing composites of bioboost produced by the plant during the week prior to sampling.
- The bottles and jars were placed into chilled storage bins and sent to AsureQuality under AECOM chain of custody procedures, where they were analysed for PFAS. Due to potential for pathogens, wastewater samples were transported in a separate bin and underwent gamma irradiation prior to PFAS analysis. Chain of custody documentation is provided in Appendix C.

<sup>&</sup>lt;sup>1</sup> pH did not stabilise after 10 minutes of purging monitoring well GND 2677 (Dawson House); a sample was subsequently collected as the remaining parameters had met stabilisation criteria.

<sup>&</sup>lt;sup>2</sup> Stabilisation of turbidity could not be confirmed for monitoring wells GND 2285, GND2740, GND0508 and GND1723 (BTW Wellington Landfarm, Ocean View Parade, Carrington Road, and Broadway, Stratford, respectively) due to faulty connection between turbidity meter and cable.

- Appropriate isolation and decontamination procedures were undertaken during sampling as per AECOM PFAS sampling protocols, with special care taken to eliminate the potential for contamination of sampling equipment, materials, and water samples with PFAS. AECOM PFAS sampling protocols have been developed in accordance with US DOD³, United States Environmental Protection Agency (US EPA)⁴ and United States Navy⁵ guidance documents, and include the use of a two-person team for groundwater, leachate, and wastewater sampling ("clean hands, dirty hands") in general accordance with US EPA Method 1669⁶, where "clean hands" handle only sample bottles during sampling and "dirty hands" handle equipment.
- To further reduce potential for cross-contamination, groundwater sampling was completed prior to leachate and wastewater sampling, as the leachate and wastewater were considered more likely to be impacted with PFAS.
- For quality assurance/quality control (QA/QC) purposes, the following samples were collected and analysed for PFAS:
  - Trip blanks were not provided by the laboratory and thus were not analysed.
  - Duplicate groundwater sample QAQC01, collected from monitoring well GND2470 (Ocean View Parade) during 'low flow' groundwater sampling.
  - Field blank sample QAQC02, collected by filling sample bottle with laboratory supplied Type 1 reagent water near monitoring well GND2740 (Ocean View Parade).
  - Equipment blank sample QAQC03, collected by pouring laboratory supplied Type 1 reagent water over the oil-water interface probe and into a laboratory supplied sample bottle, after decontaminating the probe upon completion of groundwater sampling.
  - Duplicate leachate sample QAQC04, collected from location SW01 (Colson Road landfill).
  - Field blank sample QAQC05, collected by filling sample bottle with laboratory supplied Type 1 reagent water near SW01 (Colson Road landfill).
  - Equipment blank sample QAQC06, collected by pouring laboratory supplied Type 1 reagent water over the sampling end of the Mighty Gripper and into a laboratory supplied sample bottle, after decontaminating the Mighty Gripper upon completion of leachate and wastewater grab sampling.
- Purge water and decontamination water was containerised and disposed of at the New Plymouth Wastewater Treatment plant at the completion of groundwater sampling.

# 4.0 Results

# 4.1 Groundwater Levels

Depth to groundwater measured during the August 2018 sampling event are presented in **Table 2**. Reduced groundwater levels are also presented for locations where top-of-casing (TOC) elevations were provided by TRC.

Standing water levels ranged from 0.713 metres below TOC(m bTOC) at GND2285 (BTW Wellington Landfarm) to 4.871 m bTOC at GND0508 (Carrington Road).

<sup>&</sup>lt;sup>3</sup> Department of Defence, United States (DoD), October 2016. Bottle Selection and Other Sampling Considerations When Sampling for Per- and Poly-Fluoroalkyl Substances (PFAS).

<sup>&</sup>lt;sup>4</sup> US EPÄ, January 2010. USEPA Document EQASOP-GW 001, Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, Version 3.

<sup>&</sup>lt;sup>5</sup> US Navy, September 2015. Field Sampling Protocols to Avoid Cross-contamination During Water Sampling for Perfluorinated Compounds (PFCs), Navy Guidance Document.

<sup>&</sup>lt;sup>6</sup> Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, United States Environmental Protection Agency, July 1996.

# 4.2 Field Observations

No foam or other visual evidence of PFAS presence was observed in groundwater during gauging, purging and sampling of any of the monitoring wells.

Headspace VOCs measured in the groundwater wells ranged from 1 part per million (ppm) to 2.7 ppm. A slight hydrocarbon odour was noted during gauging, purging and sampling of monitoring well GND1723 (Broadway, Stratford).

No foam or other visual evidence of PFAS presence was observed in leachate or wastewater during grab sampling. VOCs measured at the leachate sampling locations were 10 ppm (Colson Road Landfill) and 2.2 ppm (Hawera Landfill).

# 4.3 Analytical Results

# 4.3.1 Groundwater

The groundwater analytical results are presented in **Table 3**.

Perfluorooctanoic acid (PFOA) was detected in sample GND2285 (BTW Wellington Landfarm) at a concentration of 0.019  $\mu$ g/L. PFAS were not detected above laboratory limits of reporting (LORs) in the other groundwater samples.

# 4.3.2 Landfill Leachate

The leachate analytical results are presented in **Table 3**. The following points are noted.

- Perfluorohexane sulfonic acid (PFHxS), perfluorooctane sulfonic acid (PFOS), and PFOA were
  detected in the leachate sample collected from Colson Road Landfill at concentrations of
  0.15 μg/L, 0.077 μg/L, and 0.24 μg/L respectively.
- PFHxS, PFOS, and PFOA were detected in the leachate sample collected from Hawera Landfill at concentrations of 0.014 μg/L, 0.031 μg/L and 0.045 μg/L respectively.

# 4.3.3 New Plymouth Wastewater Treatment Plant

The wastewater analytical results are presented in **Table 3**. The following points are noted.

- PFHxS, PFOS, and PFOA were detected in the effluent wastewater sample at concentrations of 0.0023 μg/L, 0.001 μg/L and 0.004 μg/L respectively.
- PFAS were not detected in the influent wastewater sample above the higher laboratory LOR (0.1 μg/L) applied to this sample due its turbidity.

The bioboost analytical results are presented in **Table 4**. PFOS and PFOA were detected in the bioboost sample at concentrations of 0.0082 mg/kg and 0.0011 mg/kg respectively.

# 4.3.4 Quality Assurance / Quality Control

Samples were transported to AsureQuality, under AECOM chain of custody procedures, for analysis.

# 4.3.4.1 Groundwater Samples

Groundwater samples were collected on 6 August 2018 and were received by AsureQuality on 8 August 2018.

PFAS were not detected above laboratory LORs in the duplicate groundwater sample collected from Ocean View Parade (QAQC01), or in the field blank (QAQC02) and equipment blank (QAQC03) samples collected during and immediately after the groundwater sampling, respectively.

AsureQuality indicated that the analysis for samples GND2285 (BTW Wellington Landfarm) and GND1723 (Broadway, Stratford) could not achieve a laboratory LOR below 0.1  $\mu$ g/L owing to the high turbidity of the samples. In order to achieve a lower LOR of 0.01  $\mu$ g/L for these samples, they were reanalysed using a deviation to the accredited methodology at the request of AECOM.

**AECOM** 

# 4.3.4.2 Leachate, Wastewater, and Bioboost Samples

Leachate, wastewater, and bioboost samples were collected on 7 August 2018 and were received by AsureQuality on 8 August 2018.

PFAS were not detected above laboratory LORs in the field blank sample (QAQC05) collected during leachate sampling, or the equipment blank sample (QAQC06) collected immediately after the leachate and wastewater sampling.

The calculated relative percentage difference (RPD<sup>7</sup>) for detected PFAS concentrations reported for the primary and duplicate leachate samples collected from Colson Road Landfill are presented in **Table 5**. The RPD calculated for the primary and duplicate leachate samples ranged from 0% to 15% and were within acceptable limits (less than 20%).

While accreditation was not possible for all samples due to the specificity of matrix required for accreditation, the analytical methods were considered valid for the sample types. Overall, the QA/QC results are assessed to meet the data quality objectives for this investigation.

# 4.4 Comparison with Interim Guidelines

Groundwater, leachate, and wastewater samples have been compared against relevant interim guideline values recommended by the HEPA NEMP, comprising:

- Australian Department of Health 2017 health-based guidance values for drinking and recreation
  water, with the recreation value selected for offsite recreational users and the drinking water
  provided for reference only (groundwater is not used for drinking water at the Sites).
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000), with 95% species protection level for PFOS and PFOA selected as appropriate for the Sites and the most-conservative 99% species protection level for PFOS and PFOA provided for reference only. These values were selected for aquatic/benthic organisms.

The bioboost sample has been compared against relevant health and ecological guidance values recommended by the HEPA NEMP, sourced from:

- Human health screening values based on 20% of Food Standards Australia New Zealand
  (FSANZ) tolerable daily intake value for PFOS/PFHxS and PFOA and the National Environment
  Protection (Assessment of Site Contamination) Measure, Level-A assumptions (home-grown
  produce providing up to 10% of fruit and vegetable intake). These human health screening
  values were selected for potential residential users of bioboost.
- Human health screening values based on 20% of FSANZ tolerable daily intake value for PFOS/PFHxS and PFOA and the National Environment Protection (Assessment of Site Contamination) Measure, Health Investigation Level-C (public open space) assumptions. These human health screening values were selected for potential use of bioboost in open spaces such as parks and playing fields.
- Human health screening values based on 20% of Food Standards Australia New Zealand
  (FSANZ) tolerable daily intake value for PFOS/PFHxS and PFOA and the National Environment
  Protection (Assessment of Site Contamination) Measure, Health Investigation Level-D
  (Industrial/commercial) assumptions. These human health screening values were selected for
  onsite commercial workers.
- Interim ecological indirect exposure screening values based on 2017 Canadian Federal Environmental Quality Guidelines for Residential and Parkland (soil ingestion by a secondary consumer) and Commercial and Industrial – Coarse Soil (concentration in soil that is expected to protect against potential impacts on freshwater life from PFOS originating soil that may enter groundwater and subsequently discharge to a surface water body). These values were selected for ecological receptors.

<sup>&</sup>lt;sup>7</sup> RPD = (primary result – duplicate result) x 100 / mean result

The NEMP notes that a degree of conservatism has been included in the guidelines values which means that exceeding these values does not constitute a risk if other pathways are controlled. This inbuilt conservatism is necessary when deriving screening values to be protective of communities where multiple exposure pathways may be present.

Guideline values are presented in **Tables 3 and 4** for comparison purposes. The following points are noted:

- The concentrations of PFHxS and PFOS detected in leachate from Colson Road Landfill exceeded the interim drinking water guideline value for PFHxS/PFOS.
- PFHxS/PFOS were not detected above the laboratory LOR (0.1 μg/L) in the influent wastewater sample from the New Plymouth Wastewater Treatment Plant. The LOR is greater than the interim guideline value for drinking water (0.07 μg/L).
- The PFHxS/PFOS detected in the bioboost was close to the residential screening criteria; however, these criteria are intended to apply to soil whereas bioboost is applied as a fertiliser and would only be a small component of garden soil.

All other analytical results are below the applicable interim guideline values for PFAS.

# 5.0 Discussion

Based on this initial screening, PFAS are present in one groundwater sample (GND2677 – BTW Wellington Landfarm), landfill leachates, effluent wastewater, and bioboost. The sole exceedance of interim guideline values was for the landfill leachate from the Colson Road Landfill, where PFHxS and PFOS concentrations were above the interim drinking water guideline for PFHxS/PFOS. However, this is not considered to represent a risk to drinking water users as the receiving water is not used as a drinking water source. It is noted that, owing to the higher laboratory LOR applied to the influent wastewater sample from the New Plymouth Wastewater Treatment Plant, the PFHxS and/or PFOS LOR exceed the interim drinking water guideline for PFHxS/PFOS. However the PFHxS and PFOS concentrations in the effluent wastewater sample were below the interim drinking water guideline.

The detected PFAS concentrations in bioboost were below relevant interim soil guidelines. This indicates bioboost does not pose a significant risk to users or ecological receptors where bioboost is used.

Though PFAS were detected in groundwater, leachate, wastewater and bioboost, the concentrations in this initial screening indicate it is unlikely there is a significant risk to human health or ecological receptors.

# 6.0 Limitations

All information in this report is provided strictly in accordance with and subject to the following limitations and recommendations:

- This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by AECOM for use of any part of this report in any other context.
- b. This report is based on the conditions encountered during the sampling conducted, and information reviewed, from August to October 2018. AECOM accepts no responsibility for any events arising from any changes in site conditions or in the information reviewed that have occurred after the completion of the site investigations.
- c. The investigations carried out for the purposes of the report have been undertaken, and the report has been prepared, in accordance with normal prudent practice and by reference to applicable environmental regulatory authority and industry standards, guidelines and assessment criteria in existence at the date of this report.
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- k. It is the responsibility of third parties to independently make inquiries or seek advice in relation to their particular requirements and proposed use of the Sites.

# **Tables**



# **Table 2: Groundwater Gauging Data**

Client Name: Taranaki Regional Council Project Name: TRC PFAS Sampling Project No: 60584690

Well ID	Location	Data	Total Well Depth	TOC Elevation	SWL	Depth to LNAPL	Groundwater Elevation
well ib	Location	Date	(m bTOC)	(m RL) <sup>#</sup>	(m bTOC)	(m BTOC)	(m RL)
GND2285	BTW Wellington Landfarm	06-Aug-18	7.000	14.65	0.713	ND	13.94
GND2677	Dawson House	06-Aug-18	10.500	-	1.942	ND	-
GND2740	Ocean View Parade	06-Aug-18	3.552	-	1.228	ND	-
GND0508	Carrington Road	06-Aug-18	14.000	120	4.871	ND	115.13
GND1723	Broadway, Stratford	06-Aug-18	5.042	-	3.213	ND	-

## Notes:

SWL = Standing water level (pre-purging)

RL = Reduced level

m = Metres

bTOC = Below top of casing

LNAPL = Light non-aqueous phase liquid

 $^{\#}m$  RL = information obtained from Taranaki Regional Council ND = Not detected

- = no data or not applicable



# Table 3 - Groundwater, Leachate, and Wastewater Analytical Results

		Guidelin	ne Values					Groundw	rater Sample Det	ails and Analytica	l Results		
Receptor	Hui	man	Ecole	ogical				Ground	rater Gample Bet	and Analytica	results		
Source of Criteria	Australian	DoH 2017	ANZ	ECC	Sample Location	BTW Wellington Landfarm	Dawson House	Ocean Vie	ew Parade	Carrington Road	Broadway, Stratford	Field Blank	Equipment Blank (IF Probe)
					AECOM Sample Number	GND2285*	GND2677	GND2740	QAQC01	GND0508	GND1723*	QAQC02	QAQC03
Guideline	Drinking	Recreational	99% species	95% species	Sample Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Type 1 Water	Type 1 Water
Guideline	Water	Water	protection	protection	Laboratory Sample Reference	18-213312-1	18-213312-2	18-213312-3	18-213312-6	18-213312-4	18-213312-14	18-213312-7	18-213312-8
					Date Sampled	6-Aug-18	6-Aug-18	6-Aug-18	6-Aug-18	6-Aug-18	6-Aug-18	6-Aug-18	6-Aug-18
Perfluoroalkylsulfonic acids					Perfluoroalkylsulfonic acids								
di-PFHxS	-	-	-	-	di-PFHxS	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
mono-PFHxS	-	-	-	-	mono-PFHxS	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
L-PFHxS	-	-	-	-	L-PFHxS	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
Total PFHxS <sup>1</sup>	-	-	-	-	Total PFHxS <sup>1</sup>	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
di-PFOS	_	-	-	-	di-PFOS	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
mono-PFOS	-	-	-	-	mono-PFOS	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
L-PFOS	_	_	_	_	L-PFOS	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
Total PFOS <sup>2</sup>	-	-	0.00023	0.13	Total PFOS <sup>2</sup>	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
PFHxS/PFOS <sup>3</sup>	0.07	0.7	_	_	PFHxS/PFOS <sup>3</sup>	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
11110/1100	0.07	0.7			111111111111111111111111111111111111111	< 0.010	V 0.0010	V 0.0010	V 0.0010	V 0.0010	7 0.010	< 0.0010	< 0.0010
Perfluoroalkylcarboxylic acids					Perfluoroalkylcarboxylic acids								
PFOA	0.56	5.6	19	<u>220</u>	PFOA	0.019	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010
_		Guidelin	ne Values					Losobato and M	Vactowator Samr	de Detelle and An			
Receptor	Hui	man	Fcol					Leachate and v	vastewater Samp	Die Details and An	alytical Results		
Source of Criteria				ogical				Leachate and v	vastewater Samp	DIE DETAIIS AND AN	alytical Results		
	Australian	DoH 2017		ECC	Sample Location		oad Landfill	Hawera Landfill	Wastewater Treatment Plant (Effluent)	Wastewater Treatment Plant (Influent)	Field Blank	Equipment Blank (Mighty Gripper)	_
			ANZ	ECC	AECOM Sample Number	SW01*	QAQC04*	Hawera Landfill	Wastewater Treatment Plant (Effluent) WW01	Wastewater Treatment Plant (Influent) WW02	Field Blank  QAQC05	(Mighty Gripper)  QAQC06	_
Guideline	Drinking	Recreational	ANZ 99% species	ECC 95% species	AECOM Sample Number Sample Medium	SW01* Leachate	QAQC04* Leachate	Hawera Landfill SW02* Leachate	Wastewater Treatment Plant (Effluent) WW01 Wastewater	Wastewater Treatment Plant (Influent) WW02 Wastewater	Field Blank  QAQC05  Type 1 Water	(Mighty Gripper)  QAQC06  Type 1 Water	_
Guideline			ANZ	ECC	AECOM Sample Number Sample Medium Laboratory Sample Reference	SW01* Leachate 18-213312-5	QAQC04* Leachate 18-213312-9	Hawera Landfill SW02* Leachate 18-213312-13	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1	Wastewater Treatment Plant (Influent) WW02 Wastewater 18-201031-2	Field Blank  QAQC05 Type 1 Water 18-213312-10	(Mighty Gripper)  QAQC06  Type 1 Water 18-213312-11	_
	Drinking	Recreational	ANZ 99% species	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled	SW01* Leachate	QAQC04* Leachate	Hawera Landfill SW02* Leachate	Wastewater Treatment Plant (Effluent) WW01 Wastewater	Wastewater Treatment Plant (Influent) WW02 Wastewater	Field Blank  QAQC05  Type 1 Water	(Mighty Gripper)  QAQC06  Type 1 Water	_
Perfluoroalkylsulfonic acids	Drinking	Recreational	ANZ 99% species	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids	SW01* Leachate 18-213312-5 7-Aug-18	QAQC04* Leachate 18-213312-9 7-Aug-18	Hawera Landfill SW02* Leachate 18-213312-13 7-Aug-18	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18	Wastewater Treatment Plant (Influent) WW02 Wastewater 18-201031-2 7-Aug-18	Field Blank  QAQC05 Type 1 Water 18-213312-10 7-Aug-18	(Mighty Gripper)  QAQC06 Type 1 Water 18-213312-11 7-Aug-18	_
Perfluoroalkylsulfonic acids di-PFHxS	Drinking	Recreational	ANZ 99% species	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids di-PFHxS	SW01* Leachate 18-213312-5 7-Aug-18	QAQC04* Leachate 18-213312-9 7-Aug-18	Hawera Landfill  SW02*  Leachate  18-213312-13  7-Aug-18  < 0.010	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18 < 0.0010	Wastewater Treatment Plant (Influent) WW02 Wastewater 18-201031-2 7-Aug-18 < 0.10	Field Blank  QAQC05  Type 1 Water 18-213312-10 7-Aug-18  < 0.0010	(Mighty Gripper)  QAQC06  Type 1 Water  18-213312-11  7-Aug-18  < 0.0010	_
Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS	Drinking	Recreational	ANZ 99% species	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS	SW01* Leachate 18-213312-5 7-Aug-18 < 0.010 0.0310	QAQC04* Leachate 18-213312-9 7-Aug-18 < 0.010 0.036	SW02* Leachate 18-213312-13 7-Aug-18 < 0.010 < 0.010	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18 < 0.0010 < 0.0010	Wastewater Treatment Plant (Influent) WW02 Wastewater 18-201031-2 7-Aug-18 < 0.10 < 0.10	Field Blank  QAQC05  Type 1 Water 18-213312-10 7-Aug-18  < 0.0010 < 0.0010	(Mighty Gripper)  QAQC06  Type 1 Water 18-213312-11  7-Aug-18  < 0.0010 < 0.0010	_
Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS	Drinking	Recreational	99% species protection	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS	SW01* Leachate 18-213312-5 7-Aug-18 < 0.010 0.0310 0.12	QAQC04* Leachate 18-213312-9 7-Aug-18 < 0.010 0.036 0.12	Hawera Landfill  SW02*  Leachate  18-213312-13  7-Aug-18  < 0.010 < 0.010 0.014	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18 < 0.0010 < 0.0010 0.0023	Wastewater Treatment Plant (Influent) WW02 Wastewater 18-201031-2 7-Aug-18 < 0.10 < 0.10 < 0.10	Field Blank  QAQC05  Type 1 Water  18-213312-10  7-Aug-18  < 0.0010 < 0.0010 < 0.0010	(Mighty Gripper)  QAQC06 Type 1 Water 18-213312-11 7-Aug-18  < 0.0010 < 0.0010 < 0.0010	_
Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS	Drinking	Recreational	ANZ 99% species	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS	SW01* Leachate 18-213312-5 7-Aug-18 < 0.010 0.0310	QAQC04* Leachate 18-213312-9 7-Aug-18 < 0.010 0.036	SW02* Leachate 18-213312-13 7-Aug-18 < 0.010 < 0.010	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18 < 0.0010 < 0.0010	Wastewater Treatment Plant (Influent) WW02 Wastewater 18-201031-2 7-Aug-18 < 0.10 < 0.10	Field Blank  QAQC05  Type 1 Water 18-213312-10 7-Aug-18  < 0.0010 < 0.0010	(Mighty Gripper)  QAQC06  Type 1 Water 18-213312-11  7-Aug-18  < 0.0010 < 0.0010	_
Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS <sup>1</sup>	Drinking	Recreational	99% species protection	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS	SW01* Leachate 18-213312-5 7-Aug-18 < 0.010 0.0310 0.12	QAQC04* Leachate 18-213312-9 7-Aug-18 < 0.010 0.036 0.12	Hawera Landfill  SW02*  Leachate  18-213312-13  7-Aug-18  < 0.010 < 0.010 0.014	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18 < 0.0010 < 0.0010 0.0023	Wastewater Treatment Plant (Influent) WW02 Wastewater 18-201031-2 7-Aug-18 < 0.10 < 0.10 < 0.10	Field Blank  QAQC05  Type 1 Water  18-213312-10  7-Aug-18  < 0.0010 < 0.0010 < 0.0010	(Mighty Gripper)  QAQC06 Type 1 Water 18-213312-11 7-Aug-18  < 0.0010 < 0.0010 < 0.0010	_
Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS <sup>1</sup> di-PFOS	Drinking	Recreational	99% species protection	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS <sup>1</sup>	SW01* Leachate 18-213312-5 7-Aug-18 < 0.010 0.0310 0.12 0.15	QAQC04* Leachate 18-213312-9 7-Aug-18 < 0.010 0.036 0.12 0.16	Hawera Landfill  SW02* Leachate 18-213312-13 7-Aug-18  < 0.010 < 0.010 0.014 0.014	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18 < 0.0010 < 0.0010 0.0023 0.0023	Wastewater Treatment Plant (Influent)  WW02  Wastewater 18-201031-2 7-Aug-18  < 0.10 < 0.10 < 0.10 < 0.10	Field Blank  QAQC05 Type 1 Water 18-213312-10 7-Aug-18  < 0.0010 < 0.0010 < 0.0010 < 0.0010	(Mighty Gripper)  QAQC06 Type 1 Water 18-213312-11 7-Aug-18  < 0.0010 < 0.0010 < 0.0010 < 0.0010	_
Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS <sup>1</sup> di-PFOS mono-PFOS	Drinking	Recreational	99% species protection	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS¹ di-PFOS	SW01* Leachate 18-213312-5 7-Aug-18 < 0.010 0.0310 0.12 0.15 < 0.010	QAQC04* Leachate 18-213312-9 7-Aug-18 <0.010 0.036 0.12 0.16 <0.010	Hawera Landfill  SW02*  Leachate  18-213312-13  7-Aug-18  < 0.010 < 0.010 0.014 0.014 < 0.010	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18 < 0.0010 < 0.0010 0.0023 0.0023 < 0.0010	Wastewater Treatment Plant (Influent)  WW02 Wastewater 18-201031-2 7-Aug-18  < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10	Field Blank  QAQC05 Type 1 Water 18-213312-10 7-Aug-18  < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010	(Mighty Gripper)  QAQC06 Type 1 Water 18-213312-11 7-Aug-18  < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010	_
Guideline  Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS¹ di-PFOS mono-PFOS L-PFOS Total PFOS²	Drinking	Recreational	99% species protection	ECC 95% species	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS¹ di-PFOS mono-PFOS	SW01* Leachate 18-213312-5 7-Aug-18 < 0.010 0.0310 0.12 0.15 < 0.010 0.028	QAQC04* Leachate 18-213312-9 7-Aug-18 <0.010 0.036 0.12 0.16 <0.010 0.028	Hawera Landfill  SW02*  Leachate  18-213312-13  7-Aug-18  < 0.010 < 0.014 0.014 < 0.010 0.015	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18 < 0.0010 < 0.0010 0.0023 0.0023 < 0.0010 0.0010	Wastewater Treatment Plant (Influent)  WW02  Wastewater 18-201031-2 7-Aug-18  < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10	Field Blank  QAQC05  Type 1 Water  18-213312-10  7-Aug-18  < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010	(Mighty Gripper)  QAQC06 Type 1 Water 18-213312-11 7-Aug-18  < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010	_
Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS <sup>1</sup> di-PFOS mono-PFOS L-PFOS	Drinking	Recreational	99% species protection	95% species protection	AECOM Sample Number Sample Medium Laboratory Sample Reference Date Sampled Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS¹ di-PFOS mono-PFOS L-PFOS	SW01* Leachate 18-213312-5 7-Aug-18 <0.010 0.0310 0.12 0.15 <0.010 0.028 0.049	QAQC04* Leachate 18-213312-9 7-Aug-18 <0.010 0.036 0.12 0.16 <0.010 0.028 0.046	Hawera Landfill  SW02* Leachate 18-213312-13 7-Aug-18  < 0.010 < 0.010 0.014 0.014 < 0.010 0.015 0.016	Wastewater Treatment Plant (Effluent) WW01 Wastewater 18-201031-1 7-Aug-18 < 0.0010 < 0.0010 0.0023 0.0023 < 0.0010 0.0010 < 0.0010	Wastewater Treatment Plant (Influent)  WW02  Wastewater 18-201031-2 7-Aug-18  < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10	Field Blank  QAQC05  Type 1 Water 18-213312-10  7-Aug-18  < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010	(Mighty Gripper)  QAQC06 Type 1 Water 18-213312-11 7-Aug-18  < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010	Cells left blank intentionally for formatting purposes.

All results and criteria are expressed in units of µg/L.

\* Any tests marked with this symbol are not accredited for specific matrices or analytes (AsureQuality)
- no criteria

PFHxS = perfluorohexane sulfonic acid

di-PFHxS = total perfluorodimethylbutane sulfonic acids

mono-PFHxS = total perfluoromethylpentane sulfonic acids

L-PFHxS = linear perfluorohexanesulfonic acid

PFOS = perfluorooctane sulfonic acid

di-PFOS = total perfluorodimethylhexane sulfonic acids

mono-PFOS = total perfluoromethylheptane sulfonic acids L-PFOS = linear perfluorooctanesulfonic acid

PFOA = perfluorooctanoic acid

- 1. Total PFHxS = The numerical sum of di-PFHxS, mono-PFHxS, and L-PFHxS
- 2. Total PFOS = The numerical sum of di-PFOS, mono-PFOS, and L-PFOS
- 3. PFHxS/PFOS = The numerical sum of Total PFHxS and Total PFOS

Sources of Guideline Values:

Australian DoH 2017: Health Based Guidance Values for PFAS for Use in Site Investigations in Australia. *Australia Government Department of Health, 2017.*ANZECC: National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC, 2000. Technical draft default guideline values for PFOS and PFOA.

**Bold** - exceeds Australian DoH drinking water criteria

Italics - exceeds Australian DoH recreational water criteria

<u>Underlined</u> - Exceeds ANZECC 95% freshwater species protection criteria



#### Table 4 - Bioboost Sample Analytical Results

			Guideline Values	i .		Soil Sample Details and Analytical	
Receptor	Human			Ecological			Results
Source of Criteria	FSANZ 2017 and NEPM 1999			2017 Canadian Federal Environmental Quality Guidelines - Ecological Indirect Exposure		Sample Location	Wastewater Treatment Plant Bioboost
	Residential with	Public Open	Industrial/		Industrial/	AECOM Sample Name <sup>1</sup>	BB01*
Guideline	garden/	Space	Commercial	Residential	Commercial	Laboratory Sample Reference	18-201033-12
	accessible soil	Opace	Commercial		Commercial	Date Sampled	07-Aug-18
Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS¹ di-PFOS mono-PFOS L-PFOS Total PFOS² PFHxS/PFOS³	- - - - - - - 0.009	- - - - - - -	- - - - - - - 20	<u>0.01</u>	- - - - - - - 0.140	Perfluoroalkylsulfonic acids di-PFHxS mono-PFHxS L-PFHxS Total PFHxS² di-PFOS mono-PFOS L-PFOS Total PFOS³ PFHxS/PFOS⁴	< 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 < 0.0010 0.0082 0.0082
Perfluoroalkylcarboxylic acids PFOA	0.1	10	50			Perfluoroalkylcarboxylic acids PFOA	0.0011

#### Notes:

All results and criteria are expressed in units of mg/kg.

\* Any tests marked with this symbol are not accredited for specific matrices or analytes (AsureQuality)

- no criteria

PFHxS = perfluorohexane sulfonic acid

di-PFHxS = total perfluorodimethylbutane sulfonic acids mono-PFHxS = total perfluoromethylpentane sulfonic acids

L-PFHxS = linear perfluorohexanesulfonic acid

PFOS = perfluorooctane sulfonic acid

di-PFOS = total perfluorodimethylhexane sulfonic acids

mono-PFOS = total perfluoromethylheptane sulfonic acids

L-PFOS = linear perfluorooctanesulfonic acid

PFOA = perfluorooctanoic acid

- 1. Total PFHxS = The numerical sum of di-PFHxS, mono-PFHxS, and L-PFHxS
- 2. Total PFOS = The numerical sum of di-PFOS, mono-PFOS, and L-PFOS
- 3. PFHxS/PFOS = The numerical sum of Total PFHxS and Total PFOS

#### Sources of Guideline Values:

Food Standards Australia New Zealand (FSANZ), 2017. 20% of total daily intake value for PFOS/PFHxS and PFOA

National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999. Revised 2013.

Health Investigation Level-A (home-grown produce providing up to 10% of fruit and vegetable intake) assumptions in Section 3 of Schedule B7.

Health Investigation Level-C (Open/public space) assumptions in Section 3 of Schedule B7.

Health Investigation Level-D (Industrial/commercial) assumptions in Section 3 of Schedule B7.

Canadian Federal Environmental Quality Guidelines, 2017. Commercial and Industrial - Coarse Soil, ecological indirect exposure. Environment and Climate Change Canada.

Bold - exceeds FSANZ 2017 and NEPM 1990 criteria

<u>Underlined</u> - exceeds Canadian Federal Environmental Quality Ecological Indirect Exposure Guidelines

**Table 5: Relative Percentage Difference** 

Client Name: Taranaki Regional Council Project Name: TRC PFAS Sampling Project No: 60584690

Analyta	Primary Sample	Duplicate	RPD%
Analyte	SW01	QAQC04	KPD%
mono-PFHxS	0.031	0.036	15%
L-PFHxS	0.12	0.12	0%
Total PFHxS <sup>1</sup>	0.15	0.16	6%
mono-PFOS	0.028	0.028	0%
L-PFOS	0.049	0.046	6%
Total PFOS <sup>2</sup>	0.077	0.074	4%
PFHxS/PFOS <sup>3</sup>	0.23	0.23	0%
PFOA	0.24	0.25	4%

#### Notes:

All results are expressed in units of µg/L.

RPD calculated only for detected compounds.

RPD: relative percentage difference

PFHxS = perfluorohexane sulfonic acid

di-PFHxS = total perfluorodimethylbutane sulfonic acids

mono-PFHxS = total perfluoromethylpentane sulfonic acids

L-PFHxS = linear perfluorohexanesulfonic acid

PFOS = perfluorooctane sulfonic acid

di-PFOS = total perfluorodimethylhexane sulfonic acids

mono-PFOS = total perfluoromethylheptane sulfonic acids

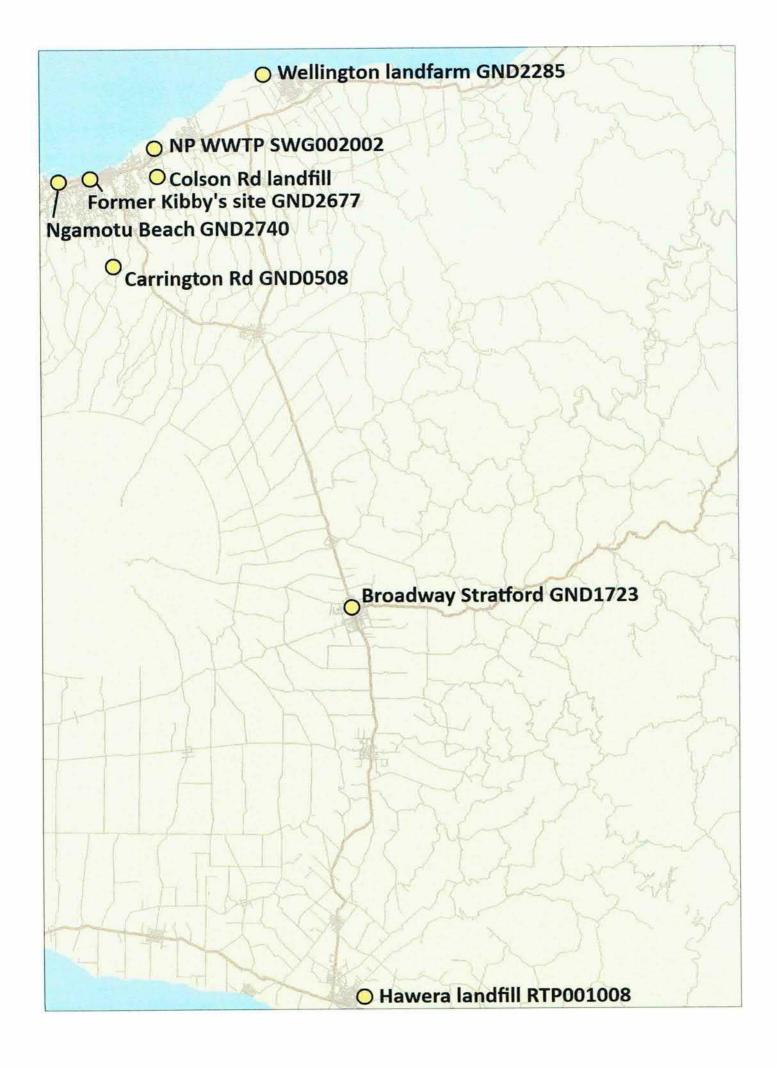
L-PFOS = linear perfluorooctanesulfonic acid

PFOA = perfluorooctanoic acid

- 1. Total PFHxS = The numerical sum of di-PFHxS, mono-PFHxS, and L-PFHxS
- 2. Total PFOS = The numerical sum of di-PFOS, mono-PFOS, and L-PFOS
- 3. PFHxS/PFOS = The numerical sum of Total PFHxS and Total PFOS

# Appendix A

**Annotated Site Cards** 



# Site Details » Groundwater Well Data

# Site GND2285 -- Wellington Landfarm MW4

Location BTW Wellington Landfarm Site, Brown Road, Waitara.

Depth (m) 7

Diameter (m) 50

Drill Date 18 Aug 2012

Elevation (m) 14.65 (accuracy: GPS at well rim)

Construction Cased & perforated

Pump Type No pump on this well

Bore Use Monitoring

Water Quality Data Location

Pump Test Data Location

Top of screen (m) 3.5

Bottom of screen (m) 6.5

Casing 1 (m)

Casing 2 (m)

High Static Water Level (m) 1.5

Low Static Water Level (m) 1.9

Site Code GND2285

Description Wellington Landfarm MW4

Location BTW Wellington Landfarm Site, Brown Road,

Waitara.

NZTM Easting / Northing 1704632 / 5683531

Site Access Access from Brown Rd., MW4 is western most

monitoring well in row of 3 north of the pit

storage area.

Uses

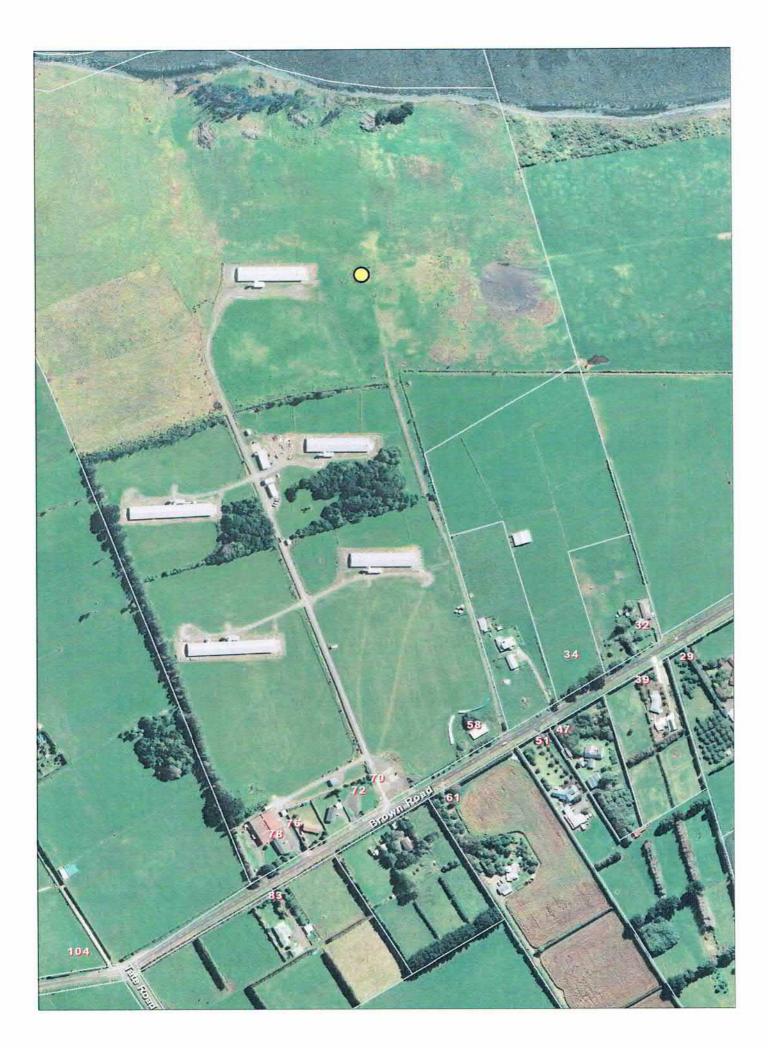
Altitude 14.65 m

Dist. from coast Not recorded

Bio Category

Bio Habitat

Last updated 4 Apr 2013 by David Olson



Site Code SWG002002

Description NEW PLYMOUTH DISTRICT COUNCIL

Location N.P.Carrousel Waste Trt.Plant

NZTM Easting / Northing 1696211 / 5679248

Site Access Carrousel Wastewater Treatment Plant

Comment Grab sample from chloronation pool. 24 hour

composite samples collected from line dropped to

outlet (image 3)

Uses Consent Monitoring

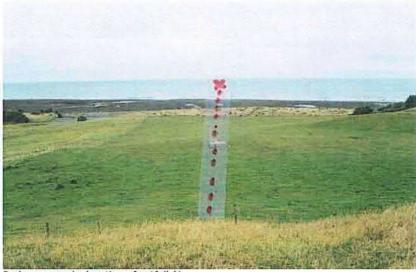
Dist, from coast Not recorded

Bio Category Bio Habitat

Last updated 1 Nov 2007 by Peter Nolly



24 hour composite sample location (1 Jan 1995)



Red cross marks location of outfall (1 Jan 1995)



Grab sample taken from site indicated by red cross in chloronation pool (1 Jan 1995)





# Site Details » Groundwater Well Data

# Site GND2677 -- Dawson House Monitoring Well

Location Dawson St Development Monitoring Bore, 97 King St

Depth (m) 10.5

Diameter (m) 50

Drill Date 23 Sep 2017

Elevation (m) (accuracy: )

Construction Drilled - screened

Pump Type No pump on this well

Bore Use Monitoring Bore (piezometer)

Water Quality Data Location

Pump Test Data Location

Top of screen (m) 1.5

Bottom of screen (m) 10.5

Casing 1 (m)

Casing 2 (m)

High Static Water Level (m) 1.8

Low Static Water Level (m)

# Strata Data

Depth (m)	Туре	Static Water Level	Comment
1	Soil		light brwn silty subsoil
2	Silt		darkish brwn sandy silt
3	No lithological data available		Drk brwn silty ash
5	Clay		darkish brwn silty clay
6	Boulder		rock boulder layer
7	Rock		Hardrock solid boulder layer
8	Sand		silty sand with loose rocks
9	Gravel		Sandy with loose rocks
10	Boulder		Hard boulder layer
12	Gravel		Med/Hard sandy gravels
12.5	Gravel C		Coarse/sandy gravels

Site Code GND2677

Description Dawson House Monitoring Well

Location Dawson St Development Monitoring Bore, 97 King

St

NZTM Easting / Northing 1692439 / 5676158

Comment Refer to bore log #1981263 for more information

Drilled by strata drilling 0.5 slotted PVC for screen

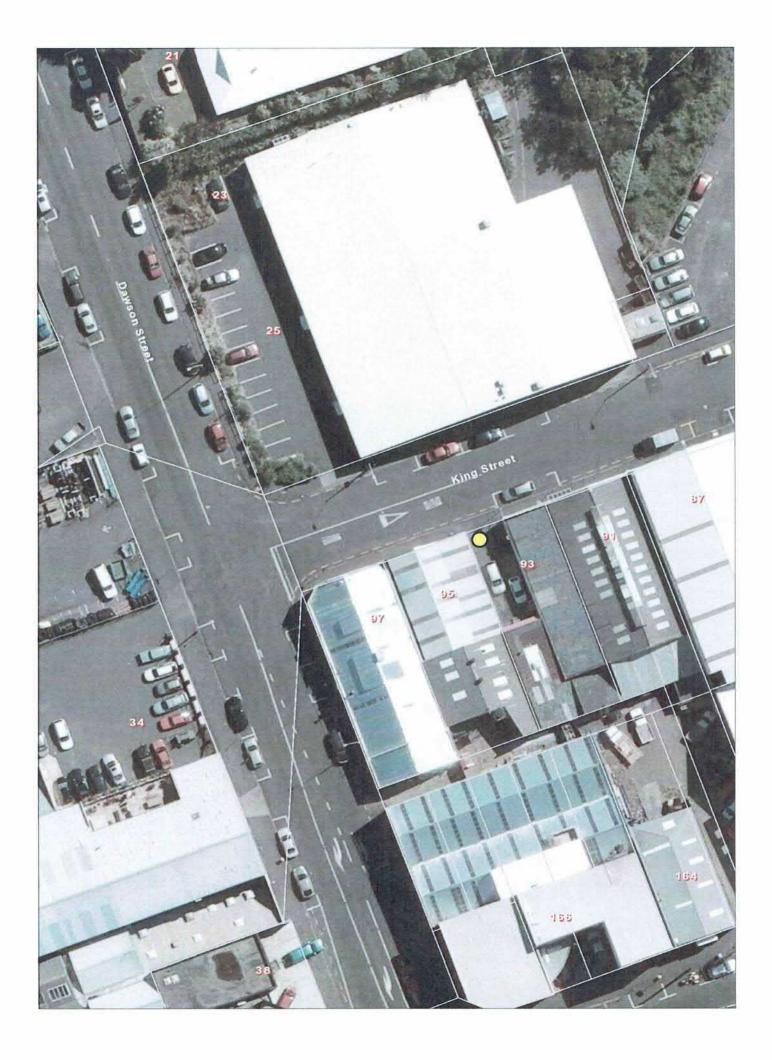
Uses

Dist. from coast Not recorded

Bio Category

Bio Habitat

Last updated 22 Jan 2018 by campbell



# Site Details » Groundwater Well Data

# Site GND2740 -- Bayly Road Historic Oilfield DSI MW2

Location Bayly Road, Down gradient fo Wetland

Depth (m) 4

Diameter (m) 0.2

Drill Date 2 Jul 2015

Elevation (m) (accuracy: )

Construction Driven pipe - screened

Pump Type No pump on this well

Bore Use Monitoring Bore (piezometer)

Water Quality Data Location

Pump Test Data Location

Top of screen (m) 1

Bottom of screen (m) 3.9

Casing 1 (m)

Casing 2 (m)

High Static Water Level (m) 1.3

Low Static Water Level (m)

# Strata Data

Depth (m)	Type	Static Water Level	Comment
0.2	Clay		Fill. Silty clay, dark brown, moist-wet, soft, plastic.
0.9	Sand		Fill. Silty fine sand w/ some gravel; orange/brown dry tight
3.4	Sand C		Fine sand, black spreckled grey. dry-moist, loosely packed
3.6	Sand		Gravelly fine sand, black. saturated, tightly packed
3.7	Clay		Silty clay w/ some sand. grey/ green streaked orange, satura
4	Sand		Gravely fine sand, black. as above

Site Code GND2740

Description Bayly Road Historic Oilfield DSI MW2

Location Bayly Road, Down gradient fo Wetland

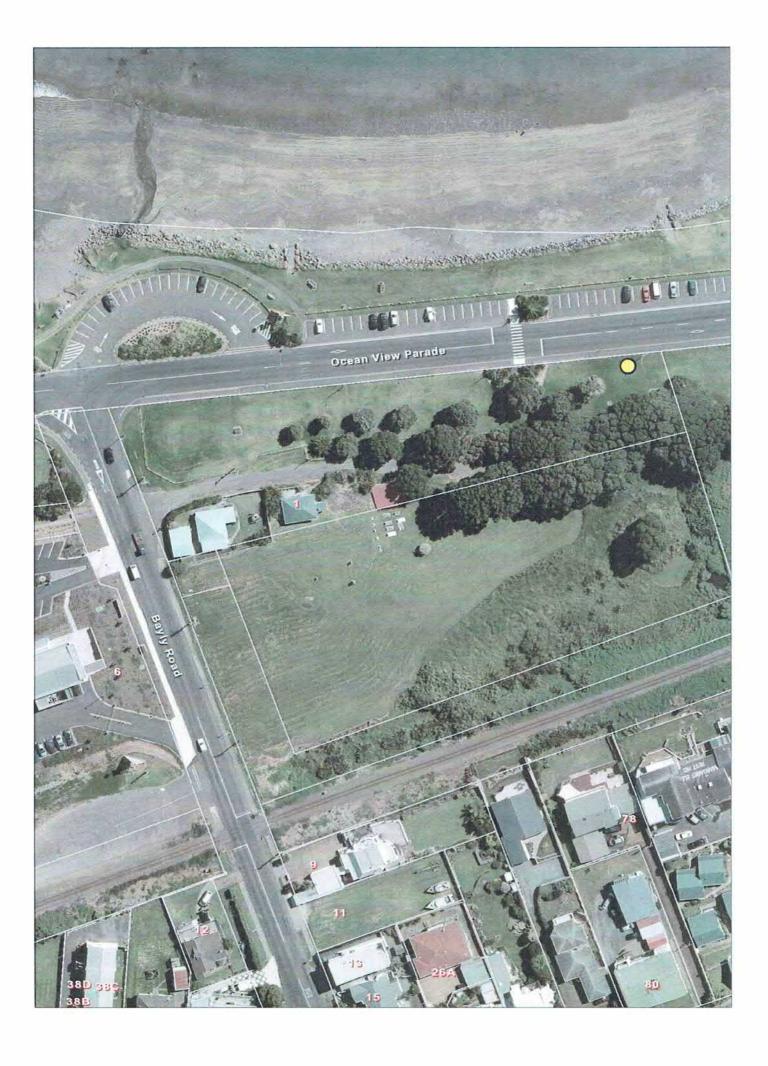
NZTM Easting / Northing 1690234.35 / 5675937.06

Uses

Dist. from coast Not recorded

Bio Category Bio Habitat

Last updated 3 Aug 2017 by Rachel McDonnell



# Site Details » Groundwater Well Data

# Site GND0508 -- GROUNDWATER SEM

Location Carrington Road

Depth (m) 14

Diameter (m) 0.1

Drill Date 29 May 2003

Elevation (m) 120 (accuracy: GPS at well rim)

Construction Drilled - screened

Pump Type No pump on this well

Bore Use Monitoring Bore (piezometer)

Water Quality Data Location

Pump Test Data Location

Top of screen (m) 8

Bottom of screen (m) 14

Casing 1 (m)

Casing 2 (m)

High Static Water Level (m) 3.3

Low Static Water Level (m) 9.3

# **Aquifer Data**

Start Depth (m) End Depth (m) Name Type

0 Volcanics Unknown

7.5 No lithological data available

# Strata Data

# Depth (m) Type Static Water Level Comment

2 No lithological data available d. brown loamy soil

3 Ash d. brown weathered ash

4.8 Mixed d. brown crystalline ash & 1cm volc lith

5 Ash Hard lense ignimbite (welded ash)

Ignimbrite

7 Sand soft sandy ash with volc lithics

14 Ash Soft sandy crystalline ash

Site Code GND0508

Description GROUNDWATER SEM

Location Carrington Road

NZTM Easting / Northing 1694021 / 5669859

River Number 391000

River Te Henui

Site Access Well on the road shoulder, across from 696 Carrington Rd

Comment SEM level & quality (NGMP) site. Isotope. Pesticide. About 1m from fence & 1m from south end. Bore workover completed on May-03 by Interdrill - Hole cleaned & deepened from 8.6 to 14.0m Screen depth not updated in database following workover. Assumed to now be located from 8 m to 14 m. WARNING:SEE NGC BEFORE DOING ANY MAINTENANCE ON THIS WELL Drilled by Hopkins; W-Clyde rpt Monitoring pipeline, location not accurate Sampled for NGMP and GW Nitrates programmes. Sampled using bladder pump. Car access for pump

power. Headworks flush with ground, metal cover requires screwdriver or manhole lifter to access. Level logger installed in

this well. No other tools required.

Hazards Roadside sampling site close to traffic in 100km area. Wear Hi Vis

Uses Investigation, State Environment Monitoring

Altitude 120 m

Dist. from coast 6.72 km

Bio Category Bio Habitat

Last updated 18 May 2018 by Regan Phipps







Site access map, can turn car in turning circle across road (26 Sep 2016)

## Site Details » Groundwater Well Data

# Site GND1723 -- GROUNDWATER

Location Standard Timber, 127 Broadway, Stratford

Depth (m)

Diameter (m)

Drill Date

Elevation (m) (accuracy: Unknown)

Construction Drilled - screened

Pump Type No pump on this well

Bore Use Monitoring Bore (piezometer)

Water Quality Data Location

Pump Test Data Location

Top of screen (m)

Bottom of screen (m)

Casing 1 (m)

Casing 2 (m)

High Static Water Level (m) 3.5

Low Static Water Level (m)

# **Aquifer Data**

Start Depth (m) End Depth (m) Name Type

0

Volcanics Unknown

Site Code GND1723

Description GROUNDWATER

Location Standard Timber, 127 Broadway, Stratford

NZTM Easting / Northing 1710600 / 5645134

Site Access Toby cap on roadside verge outside premises

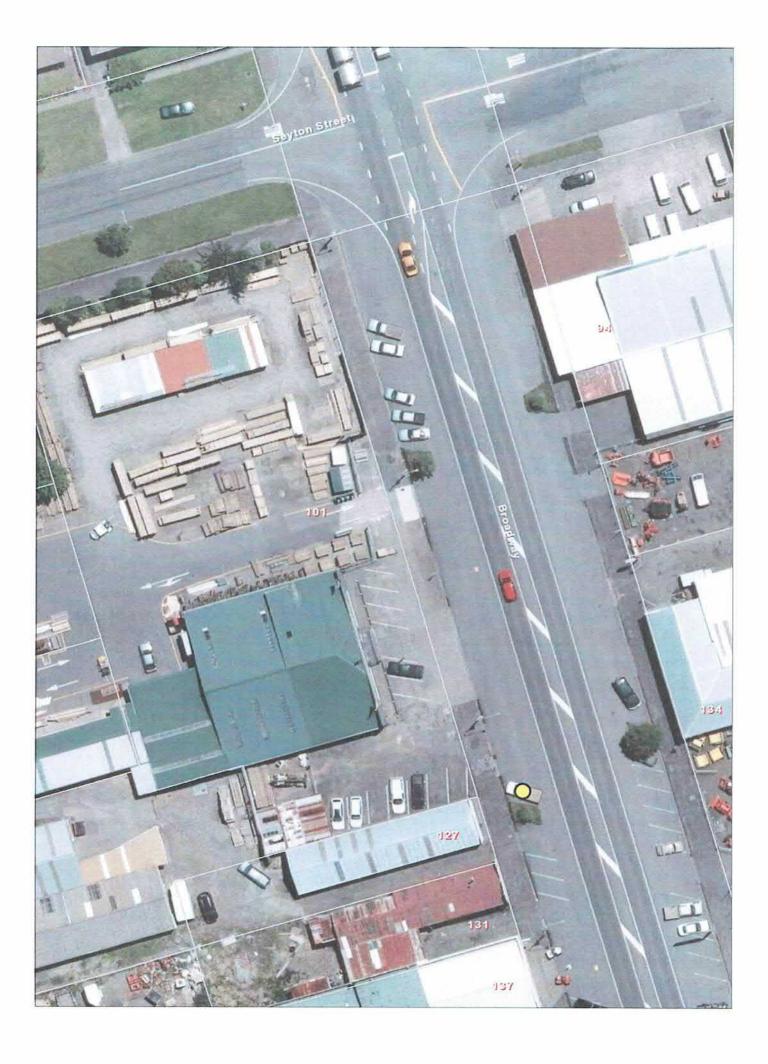
Uses Investigation

Dist. from coast Not recorded

Bio Category

Bio Habitat

Last updated 1 Nov 2007 by Peter Nolly



Site Code RTP001008

Description SOUTH TARANAKI DISTRICT COUNCIL

Location Hawera Landfill leachate from sump.

NZTM Easting / Northing 1711333 / 5617107

River Number 348010

River Tawhiti 1 (Tangahoe)

Site Access Via dairy track off 2a Ropata St.

Comment Discharge to sewer. Lift grille over top of leachate

sump and sample - use a pole. Wear gloves.

Uses Consent Monitoring

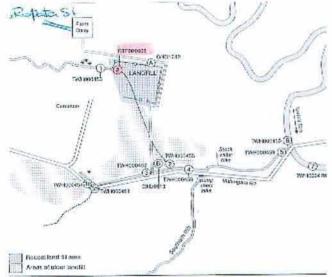
Altitude 80 m

Dist, from coast Not recorded

**Bio Category** 

Bio Habitat

Last updated 1 Nov 2007 by Peter Nolly



Location diagram (No date)



Old sewage leachate structure (5 Dec

2014)



# Appendix B

Field Sampling Sheets

### FQM - NAPL and Groundwater Level Gauging Record

ect Name:		TRC PF	91	Project Location:		VARIOUS	TRL SI	1763	PM I	lame:	SEAN FINDLENS
ect Number:		605846	90/1-2	Client:			9KI REC		Fieldwork	Staff Name:	REBETCA JOYCE
N. P. C.			Confirm NAPL and	groundwater levels by	repeat measurements.	All columns must be co	impleted. If NAPL is no	ot present in a well write	'ND' (Not Detected) in	the relevant column.	
						Field	Data				<b>《大学》,"大学,"</b>
Well ID	Date (dd/mm/yy)	Time (24hr;mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)		Comments
02740	6/8/18	10.09	1.0		1.228		(IIIB100)	3.552	(m)	FAIR N	(well condition, odour, NAPL colour and viscosity)  VO_NOCOLOUR / TURB/D
00508		11.35	2-3		4-871			14.0			IVO, NO COLOUR /TURBIL
2677		12.53	1.6		1-942			10.5			VO, NO COVOUR/TURBIDITY
D 2285		14.25	1.3		0.713			7.0		TAR N	VO, NO COUDURITURE - FED
1723	1	16-00	2.7	-	3.213			5-042		FOR. S	LIGHT HE ODOUR IN PUR
				3.7							
						discount of					
											9
										10/10/10/10	
							110				
									TE CONTROL		
ement Equi	pment						Notes/Comments				
Model:	P10 12	12869	Supplier:	VANO	VACT LT	10	(PID) - photo ionisation d top of casing	etector; (ppm) - parts per	million; (LNAPL) - light no	n-aqueous phase liquid	s; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metre
o.:			Calibration Report Provided?	YEJ.							
val and Distri	ibution										
				7	118	118			11		1441410
		Fi	eldwork Staff Signat	ure	6/8/ Date	10			ject Manager Signat		14/11/18

Project Name:		01	DEAT	Project Number:	11-	9/11/00	PM Nam			CERNI WILDIENS	e ID: GNO	
Client:						84690						118
Cilent:		TRL	nformation	Project Location:		ameter Info.	Fieldwor	rk Staff:			ell Development or Well Sar	
Date of GW Lev			Bore Radius (mn	n): 150	Chem Kit Seria			contaminated	-	Sampling Method  Low Flow Pump rate: (00 m//n)	Hydrasleev Hydrasleeve Size:	Monitoring
Depth to GW (n	0/0/	AND THE RESERVE	Screen Interval (	-	Chem Kit Mode		ru De		-	//	Hydrasleeve Type:	sequence followed
Bore Depth (m-		52	Casing Radius (r			dox: Y / N		sposable	п	Intake depth:  Bailer Hydrasleeve	Sampling Depth (m-pvc):	(number in order): Gauging
Depth to Produc	1790	_	Cover Type (gati	ALCOHOL TO THE RESERVE TO THE RESERV		W. C.	ependent) T Ot		_	Peristaltic Pump Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickne		-	Bore Locked (YE			thod: Dov		ner (specify)		Other (specify)	Sampling Start Time:	Hydrasleeve ou
			Secretary and a second secretary	icable): SIZE 7		□ Ret				Other (specify)	Company Clary Time.	Parameters
Calculated bor	re volume (L):			des bore annulus	(circle)	# purge volur			Total	l purged volume (L):		1 drameters
NAME OF STREET					madia de la companya		r Quality Paran	neters	T Otta	r parged volume (E).		
Time	Cumulative Vol. Removed (L)	SWL (m-pvc	Pump Ra	te DO (ppm or mg/L	E.C. (mS/cm or μS/cm)	рН	Redox (mV)	Temp %		0	dour, Colour, Turbidity	
10:09	0.5	1.23	4 100mi	Vm 4.09	288.7	6-10	5-3	15.3		TURB -> 4-8 NT	U NVO	
10:14	1.0	1	i	3.77		6.10	-16.9	14.6		3-9	1	
10:14	1.5			3.73	289.7	6.09	-19.6	14.1		6	*	
10:24	2.0	I	1	3.90	289.5	6.07	-17-7	14-0	2	* NOTE TURBIO	174	
, <u></u>						-				METER MALF		- MAYRE
										CONNECTION		
			7 10 10 10 10 10 10 10 10 10 10 10 10 10					1	$\rightarrow$	PROBE - SE		
-		- Indiana						-	$\rightarrow$			
								-		VALUED WITH	CORD HOSE	JIMEN.
			_						-			
									$\neg$			
												100 000
Arrowlers	Name and Address of the Owner, where the Owner, which is the Owner,		Parameter Rar		± 3%	± 0.05	± 10 mV	± 0.2 °C		± 10% tu	rbidity (if using a turbidity meter)	
	es Sampled fo	I.C.		Bottles Co		COMPANY AND ADDRESS OF THE PARKS OF THE PARK		QC Information			Field Commets	
Field Filtered:	Unfiltered:		x 40 mL Vial		) mL Ferrous	x 60 mL metals (	HNO3) QAQ	CO1-DU	שו	Bore volume calculation, b	ore condition, fate of tubing, redox of	correction etc.
			2 x 40 mL Vial		00 mL Amber	x 250 mL Plastic	RAQU	02-00	ANK	Ambient PID=	0.8 - do	NAhole
			IXPPH	250			WHOLE	RINSATE		0		1.0
		11.505.50.00		Approval and Dist	ribution			(EDD)		100	KED BY SO	> 7
/	1)		6/8			6. W		14/11/		ALIFA	2-1	
Fieldwo	rk Staff Signatu	ire	6/8/ Date			ame and Signa	ture	Date		TILLEN I	KEY - NO DE	D. TUBIA
0	5 6		14/11	/18								
	t Manager Sign		Date	, 13					- 1			

Q4AN(EV)-405-FM1

					G	ND	0508							Bore ID:	GN.	9 0508
Project Name:	7	TRCI	OFAS	Projec	t Number:	605	84696		PM Name		SEA	NH	UDGENS	Sample Date:	67	8/18
Client:		TRC		Projec	t Location:	-	INGTON,	RD	Fieldwork	Staff:	Q.1 7		SITRO		nent or Well San	npling Event? (circle)
	Gen	eral Bore	Information	n		Par	ameter Info.		Decon	amination	Sa	mpling			Hydrasleev	
Date of GW Le	evel: 4	87/	Bore Radiu	s (mm):		Chem Kit Seria	l No.:		TI Dec	ontaminated	Low Flo	w Pump r	rate: /00 m	// Hydrasleev	e Size:	Monitoring
Depth to GW (	m-pvc): 🗸		Screen Inte	erval (m):		Chem Kit Mode	el:		Dec			Intake		Hydrasleev		sequence followed (number in order):
Bore Depth (m	-pvc): /4. (	2	Casing Rad	dius (mm):	50	Corrected Red	dox: Y / N		II Dist		FI Bailer		■ Hydraslee	ve Sampling D	lepth (m-pvc):	Gauging
Depth to Produ	uct (m-pvc): -		Cover Type	gatic/stic	k up):	(The correction t	o apply is probe de	pendent)	FI Oth	er (specify)	F Peristalti	c Pump F	1 Waterra	Hydrasleev	e Install time:	Hydrasleeve in
Product Thickn	ness (m):		Bore Locke	ed (YESANO	DE CO		thod: Dow			(-)//	Other (s)			Sampling S	tart Time:	Hydrasleeve out
			Key Type (i	if applicable	e): N/A		FI Retri	ieved				,,			77	Parameters
Calculated bo	ore volume (L)		Includes/	excludes b	ore annulus (c	ircle)	# purge volum	nes rem	oved:	_	Total purged	volume	(L): 2 ·	21		10 CONTENT PROPERTY.
							Water	Quality	y Param				(-)			
Time	Cumulative Vo Removed (L)	i. SW (m-p	Put	mp Rate	(ppm or mg/L)	E.C. (mS/cm or µS/cm)	рН	(17,000	edox mV)	Temp ℃			44.45	Odour, Colour,	Turbidity	
11=35	0.5	4-8	371 100	mIlm	6.61	121-3	5.81	1.3	10	17.0	Tu	do 1	-4 ~	TU	NI	10
11:40	10.0	5-		1	5:62	119-2	5.75	1)	.0	17-0	js		7-3	n	1	
11:45	1-5				5-60	118-0	5.74		. 9	17-2			2.4	II.		
11:50	2.0	5-15	1	¢	5:77		5.72		. 8				-	7.60		
11.70	A	2-10			3. 1 1	116-1	5-12	-4	- 8	17.7		ří	10.5	M		
			_							/						
								_				NO	076: 1	urbidi	y me	ter
											11	200	echor	nich	lem d	1 nendina
												nn	25116	00 01	Frond	Lepending - change
	1	1,						_						011 01	coro.	-Criarigi
		+	_					_			- 1	Con	16.			
	_															
	1	Acceptab	e Paramete	r Range:	± 10%	± 3%	± 0.05	± 1	0 mV	± 0.2 °C			± 10	% turbidity (if using	a turbidity meter)	14.0
Analy	tes Sampled	for:	T		Bottles Col	lected			QA/Q	C Information	on			Field Com		
Field Filtered:	Unfiltered	d:	x 40 m	L Vial (HCI)	x 60 t	mL Ferrous	x 60 mL metals (H	HNO <sub>2</sub> )		and the state of t		Bore v	volume calculati	on, bore condition,	fate of tubing, redox of	correction etc.
				L Vial (H <sub>2</sub> SC		mL Amber	x 250 mL Plastic	-3/			0 8					
			10000000	1.02	2.100		ECO INC 1 Idable	$\vdash$			2.0	in	- 00	nbient	2-20	pm
					-			-			1		A .	N		
	7			Ap	proval and Distri	bution					To	emp	T do	a 10 +10	w cell b	pen pengin
1	/		6	1811	8	Viete	W-			14/11/	1.8		P.	1.		U
Fieldw	ork Staff Signa	ture		Date		/	ame and Signat	ture	_	Date	0	RU	sun lip	int.		
9	1/1		٥				reston (1887-1981) 1884-1985 (1884-1985)				into	11	11	didion	HA E	1 4 6.
Proje	ect Manager Si	gnature		1/11/18 Date	Diete	ibution: Project 0	entral File				100	11 6	1100	neurca	100 10	WIN TO
	ugu oi	g			Distr	is auton. Project C	Zentrat File									

water level logging - constant wire positioned within well -regularly monitored + decontaminated n bleach solution.

											Bore ID:	GND	2677
Project Name:	TR	C PF.	Pr Pr	oject Number:	6058	4690	PM Na	me:		SEAN HUDGENS	Sample Date:	6/1	8/18
Client:	7	RC	Pr	oject Location:	DAN	SON HO	WE Fieldw	ork Staff:		RJ + AS (TRC)	Well Development	or Well Sam	pling Event? (circle)
	The second secon	-	Information	Article Report		ameter Info.		ontamination		Sampling Method	the second second second second second	Hydrasleeve	
Date of GW Le	3/ -/	118	Bore Radius (mm)		Chem Kit Seria			Decontaminated	FI	Low Flow Pump rate: 100m//	/_ Hydrasleeve Size	:	Monitoring sequence followed
Depth to GW (r		942	Screen Interval (m	):	Chem Kit Mode		FL	Dedicated		Intake depth:	Hydrasleeve Typ	9:	(number in order):
Bore Depth (m-		2.5	Casing Radius (m	A CAN COLOR OF THE CAN	Corrected Red			Disposable	П	Bailer Hydrasleev	ve Sampling Depth	m-pvc):	Gauging
Depth to Produ	117 447		Cover Type (gatical			o apply is probe de		Other (specify)	u	Peristaltic Pump Waterra	Hydrasleeve Inst		Hydrasleeve in
Product Thickn	ess (m):		Bore Locked (YES	ACCUPATION OF THE PARTY OF THE PARTY.	Parameter me	thod: Dow	New Programme		FI	Other (specify)	Sampling Start T	me:	Hydrasleeve out
			Key Type (if applic	able): 7R /		□ Retr							Parameters
Calculated bo	re volume (L):		Includes/ exclude	es bore annulus (	circle)	# purge volum	MARINE DOMECUST LIFE ALL ALLOWS		Tota	al purged volume (L):			
					E.C.	Water	r Quality Para	ameters					
Time	Cumulative Vol Removed (L)	. SWL (m-pv	Pump Rate	DO (ppm or mg/L)	ImSlem or	рН	Redox (mV)	Temp ℃			Odour, Colour, Turbi	dity	
12:53	0.5	2-0;	24 100m//n	5-50	225-4	6.43	45-6	18.03	7	TURB 13.0	NTU NU	0	
12:58	1.0	1	1	5-72	225.1	6.41	47.2	18.80	0	13.9			
13:03	1.5	1		5-54	224.4	6:35	52.3	18.8		12.2			
10			- V				-	10.2					
		+										2002	
		<del> </del>	-										
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		-									240.43718		
		100										•	
										100 BENE			
						15. 2.W						141	
	A	cceptable	Parameter Rang	je: ± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C		± 10	% turbidity (if using a turb	idity meter)	and the state of the state of
Analyt	tes Sampled f	or:		Bottles Co	llected	NO DESCRIPTION	QA	/QC Information	on		Field Commets	Kinking.	
Field Filtered:	Unfiltered	:	x 40 mL Vial (H	ICI) x 60	mL Ferrous	x 60 mL metals (	HNO <sub>3</sub> )	,		Bore volume calculation	on, bore condition, fate of	tubing, redox co	prrection etc.
			x 40 mL Vial (F	1 <sub>2</sub> SO <sub>4</sub> ) x 100	mL Amber	x 250 mL Plastic				WELL CONT	MINED U	VATET	24
			# X TOM	250						TUBING			
										ambient			
R TO SHALL BOOK A	1,7		1101	Approval and Distr		ornistaviinielisi.		ere ed ve o		PID= 1.0			
Ciald	of Croff Cia	huma	6/8// Date	8		4 W		14/11/1 Date	.8	ppo	n		
Fieldwe	ork Staff Signat	cure			Checker N	ame and Signat	ture	Date		PID= 1-9 ppr.	1.6 ppm		
Proje	ct Manager Sig	nature	14/11/18 Date	— Distr	ibution: Project C	Central File							

Project Name:	17	RC P	EAT	Section N		100	20.00						Bore	NA.O		2285	
Client:		TRC	71-	Project Nun	anamati.		84690 /		PM Name		-	SEAN MUDGENS	SHOUTH ST	ple Date:	6/8		
ment.			nformation	Project Loca	ation:	100	-WAITA	RA	Fieldwork		/	() + AS (TRC)	Wel	I Developme	THE RESERVE THE PERSON NAMED IN	pling Event? (circle)	
Date of GW Le		110	Bore Radius (mr	20	0	Chem Kit Seria	ameter Info.	_		tamination		Sampling Method			Hydrasleeve	info. Monitoring	
	m-pvc): 0 - 7		Screen Interval (		0	Chem Kit Mode		_		contaminated	1	ow Flow Pump rate: 1001	n//n			sequence followed	
	-pvc): ~ 7	-	Casing Radius (r		)		lox: Y / N		Dec			Intake depth:		Hydrasleeve T		(number in order):	
AND DESCRIPTION OF THE OWNER,	uct (m-pvc):		Cover Type (gat						Dis		FI B	AND ALL THE PARTY OF THE PARTY	eve	Sampling Dept		Gauging	
Product Thickn			Bore Locked (YE				apply is probe de		Oth	er (specify)		Peristaltic Pump Waterra	_	Hydrasleeve Ir		Hydrasleeve in	
	1000 (111)		Key Tipe (if appl		21	Parameter me	thod: Netri		_		III C	Other (specify)		Sampling Start	Time.	Hydrasleeve out	
Calculated bo	ore volume (L):	7.0														Parameters	
outed by	re volume (E).	100	Includes/ exclu-	ies bore a	innulus (d	circle)	# purge volum	_	-	-	Total	ourged volume (L): /-	2				
	Cumulative Vol.	CIAII				E.C.	water		ty Param	eters	-						
Time	Removed (L)	(m-pvc)		te (ppm	or mg/L	(mS/cm or µS/cm)	рН		(mV)	Temp °C	:		Od	our, Colour, Tu	rbidity		
14:25	0.0	0.71	3 100 m	1/m 2	5.2	4076	6.08	20	4.4	16.8	3	TURBIDITY 7	4	. 7	NTO		
14:30	0.5	0.73	36 1	1	3.7	4079	6.10	_	2.9	16.5	_			7			
14:35	1.0	1		_	. 5	4081	6.08		8.9		_			. 2			
14:40			1		8.7	4077		_		16.3							
	10				2 · T	7077	6.07	- 2	1.8	16.3			44	1-6			
													_				
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35 1 1	A	cceptable l	Parameter Rar	ge:	10%	± 3%	± 0.05	±	10 mV	± 0.2 °C		+1	0% tuch	oidity (if using a tu	urhidity meter)		
Analyt	tes Sampled fo			-	ttles Col					2 Informatio		±.		Field Comme			
ield Filtered:	Unfiltered:		x 40 mL Vial	HCI)	x 60 s	mL Ferrous	x 60 mL metals (H	NO-)		Cale State of Control		Bore volume calcula					
		1	x 40 mL Vial			mL Amber	x 250 mL Plastic	103)			-	Bore volume calcular	-			176206000000000000	
			100	24/	X-100	THE ARRIVET	A 200 IIIL Plastic					NOTE - TURB	101	17 116	CONFO	LIKE FAULT	
		h			+							IN LON	NE	TTIAN	BVA	CIRE HOL	(*)
		15 13		Approval	and Distri	bution						1.1TM 1	100	17/00/	15	The second	
1	X		7/1	3/18		Victor	25			14/11/1	$\overline{}$	PID 3 13	01	FOICAN	ZII -	EVID	ENCERE
Fieldwo	ork Staff Signati	ure	Date		-		ame and Signati	ire	_	14/11/1 Date	. ŏ	010 - 13		-,-,,	100	81NO - 000	THY OXIDIJED
	1		14/11/	18								PID - 1.3,	001	20		ON	DUTER SURFA
Proje	ct Manager Sign	nature	Date		Dietri	bution: Project Co	entral File					ambiento					
		VE 2014 FO			2.311	Troject C	united File					4111010111	1	0001	77.		

Project Name:	122000	TRCI	PFAJ Proj	ect Number:	605	84690	PM	Name:	5	FAN HUDGENS	Sample Date:	6/	8118
Client:	T	RC	Proj	ect Location:		PATFORD	Field	dwork Staff:	K	1+A3 (TRC)	Well Development	The state of the s	pling Event? (circle)
	Michigan Company of the Company of t	STATE OF THE PERSON NAMED IN	formation			ameter Info.	-	econtamination	-	Sampling Method		Hydrasieev	e into.
Date of GW Le	evel: 6/8	1/8 8	Bore Radius (mm):	150	Chem Kit Seria	al No.:	10	Decontaminated	H Lo	w Flow Pump rate: /00m	/// Hydrasleeve Size		Monitoring sequence followed
Depth to GW (	m-pvc): 3.2	13 S	Screen Interval (m):		Chem Kit Mod	el:	KI	Dedicated		Intake depth:	Hydrasleeve Type	):	(number in order):
Bore Depth (m	-pvc): 3-04	42 0	Casing Radius (mm	): 50		dox: Y / N		Disposable	FI Bai	iler 📋 Hydrasleev	e Sampling Depth (	m-pvc):	Gauging
Depth to Produ	ict (m-pvc):	C	Cover Type (gatic/s	tick up):	(The correction	to apply is probe dep	endent)	Other (specify)	Per Per	ristaltic Pump   Waterra	Hydrasleeve Insta	ill time:	Hydrasleeve in
Product Thickn	ness (m):		Bore Locked (YES/I	30,000,000	Parameter me	ethod: Down		10.0	I Ott	her (specify)	Sampling Start Ti	me:	Hydrasleeve out
		K	(ey Type (if applica	ble): TR/		☐ Retrie	eved						Parameters
Calculated bo	ore volume (L):	Ir	ncludes/ excludes	bore annulus (	circle)	# purge volume			Total pu	urged volume (L):			
				1	E.C.	Water		arameters					
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	(ppm or mg/L)	(mS/cm or µS/cm)	рН	Redox (mV)		С		Odour, Colour, Turbid	lity	
16-00	0.5	3-262	2 100ml/n	2-46	198.7	6.20	-39	4 15-9	2	TURB 17.2	NTU		
16-05	1.0	3.28	2 1	1.40	198.7	6.19	-39	0 15-9	7	12.3			
16.10	1.5			1-27	201-0	6.19	-39.	7 15-8		8-6			
16.15	20	1		1.19	202.4	6.20	- 36.	2 15-9	Z	7.0			
										- hydroca	ton oo	OUR	1 11
										ourge ou	ater +	hud.	rocarbon
									1	purge no	oted on	ale	athene
				10						tubing	(at bo	101	that
											nell		
							100						
										- Inconsisi	ent tur	6- 10	eadingi
										based on			thoning.
										CHOCH OIL	20,0,	- poor	
	Ac	ceptable P	arameter Range	± 10%	± 3%	± 0.05	± 10 m	√ ± 0.2 °C		± 10°	% turbidity (if using a turbi	dity meter)	
Analyt	tes Sampled fo	16		Bottles Col	lected		0	A/QC Information	on		Field Commets		
ield Filtered:	Unfiltered:		x 40 mL Vial (HC	l) x 60 i	mL Ferrous	x 60 mL metals (Hi	NO <sub>3</sub> )			Bore volume calculation	on, bore condition, fate of t	ubing, redox c	orrection etc.
			2 x 40 mL Vial (H <sub>2</sub> :	SO <sub>4</sub> ) x 100	mL Amber	x 250 mL Plastic			0	mbrent Pl	D = 3.000	27	
			1 X TPM.	250					30.30	donoh	OK = 2.7	nom	
							1			Court		100	downhoe.
Average English of Co.	17	mekuzilohit./n	116	pproval and Distri		Market and Company of the Company of			1	existing was	attro tut	THE P	whim / H
Fieldwo	ork Staff Signatu	re	Date	10	Checker N	ha W lame and Signatu	Iro	14/11 Date	/18	TOUR PO TENTA	ve to g		acting ( ")
// 2	5/4		_3		OHECKE! IN	and orginatu		Date	0	parced as	ater had	HC	Odour.
Proje	ct Manager Sign	ature	14/11/18 Date	_	bution: Project (	Central File				nown.  -purged are  -ambi  nigh du  cur exp	ent PIL	read	21795
										high du	0 6	NOX 10	as for to

										Bore ID:	15001
Project Name:	7	TRC,	PFAS	Project Number:	6058	4690 11	2 PM Name:		SEAN HUDE	EN Sample Date:	7/8//8
Client:		TRO		Project Location:	- Indiana and a second	N RD LAND		Staff:	RJ		r Well Sampling Event? (circle)
		neral Bore	Information			ameter Info.		amination	Sampling Metho		lydrasleeve info.
Date of GW Le		/	Bore Radius (n	nm):	Chem Kit Seria	l No.:			Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed
Depth to GW (			Screen Interva		Chem Kit Mode	el:	FI Ded	icated	Intake depth	: Hydrasleeve Type:	number in order):
Bore Depth (m			Casing Radius	(mm):		dox: Y / N	FI Disp		□ Bailer □ Hyd	drasleeve Sampling Depth (n	
Depth to Produ			Cover Type (ga	atic/stick up):	(The correction t	o apply is probe depen	dent) FI Othe	er (specify)	Peristaltic Pump Wa	aterra Hydrasleeve Instal	Htime: Hydrasleeve in
Product Thickr	ness (m):		Bore Locked (	(ES/NO):	Parameter me	thod: FI Downho	e /		Other (specify)	Sampling Start Tin	ne: Hydrasleeve out
			Key Type (if ap	plicable):		Retrieve	d		GRAB		Parameters
Calculated bo	ore volume (L)	):	Includes/ excl	udes bore annulus	(circle)	# purge volumes	removed:		Total purged volume (L):		
						Water Q	ality Parame	eters			
Time	Cumulative Vo Removed (L)	200	Piimn i	Rate (ppm or mg/L	E.C. (mS/cm or μS/cm)	рН	Redox (mV)	Temp ℃		Odour, Colour, Turbidi	ity
9:19				2.97	7289	7.07	25-2	18.5	O NTU =	70.9	
					2201	/				_	
						<del>                                     </del>					
		_				<del>                                     </del>					
	-					-					
		_									
						<del>                                     </del>					
	-	+			-						
	-									¥	
	-	Acceptable	e Parameter R	ange: ± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C		± 10% turbidity (if using a turbid	fity meter)
Analy	tes Sampled	for:		Bottles C	ollected		QA/Q0	Informatio	n	Field Commets	
Field Filtered:	Unfiltere	ed:	x 40 mL Vi	al (HCI) x 6	mL Ferrous	x 60 mL metals (HNC	a)		Bore volume	calculation, bore condition, fate of tu	ubing, redox correction etc.
			x 40 mL Vi	With walk to	00 mL Amber	x 250 mL Plastic					
									QAQCO	4 - duplica	94
										s - Field	
,	7			Approval and Dis		age Earling			6000	10 - 1/210	DIGHT
Hi			7/	8/18	Vseky	W		14/11/18	Q A Q C O	6 - KINSATO	E CFROM MIGHTY6.
Fieldw	ork Staff Signa	ature	Date	e -	Checker N	ame and Signature		Date	PID		AT
-	15		14/11	/18					110 = 10	· Open - back	round Gigan
Proje	ect Manager Si	ignature	Date	e Dis	tribution: Project (	Central File				P	- Sport

2:15pm.

oject Name:	7R	(- PI	FAS 2018	Prois	ect Number	100	-0400					Bore ID:	50	V02
ient:	7.6	3.0	2010	1000	ect Location:		8490		PM Name:		SEAN HUDGENS	Sample Date:	7/	18/18
	Gene	ral Bore	Information	rioje	ct Location;		rameter Info.	7	Fieldwork Staff:		RJ	Well Developme	ent or Well Sa	mpling Event? (circle
ate of GW Lev			Bore Radius (r	mm):		Chem Kit Ser	NAME OF TAXABLE PARTY.		Decontamina	_	Sampling Method		Hydraslee	ve info.
epth to GW (m	n-pvc):	/	Screen Interva		/	Chem Kit Mo			Decontam		Low Flow Pump rate:	Hydrasleeve	Size:	Monitoring sequence follower
ore Depth (m-p	ovc):		Casing Radius		/		edox: Y /		Dedicated		Intake depth:	Hydrasleeve	Гуре:	(number in order)
epth to Produc	t (m-pvc):		Cover Type (ga						Disposable		Bailer FI Hydraslee	ve Sampling Dep	oth (m-pvc):	Gauging
duct Thicknes	ss (m):		Bore Locked	_			to apply is probe		Other (spe	cify)	Peristaltic Pump Waterra	Hydrasleeve I	nstall time:	Hydrasleeve in
			Key Type (if ap			r arameter m	ethod: II Do	Charles and the Control of the Contr		1:	Other (specify)	Sampling Star	t Time:	Hydrasleeve ou
culated bore	e volume (L):	_		0.00	bore annulus (c		FLRe				6RAB			Parameters
	(=).	_	includes/ exci	ludes	bore annulus (c	ircle) —	# purge volu			To	tal purged volume (L):			
-	Cumulative Vol.	CIAG				E.C.	Wate	er Quality	Parameters					
Time	Removed (L)	SWL (m-pvc	Pump F	Rate	(ppm or mg/L)	(mS/cm or µS/cm)	рН	111050	dox nV) T	emp °C		Odour, Colour, Tu	rbidity	Sulley Physia D
4:15					5.43	1360	678	-37	2.0 /	5.4	NTU >	96.3		
											1410	78.0		
								1						
								-	_					
								-						
				_				-						
								-						
				-										
		-												
				-										
-				_										
	Acc	entable l	Parameter Ra		1.000									
Analytes	Sampled for:		arameter Na	inge:	± 10%	± 3%	± 0.05	± 10		).2 °C	± 109	6 turbidity (if using a tu	rbidity meter)	
Filtered:	Unfiltered:				Bottles Colle				QA/QC Inform	nation		Field Comme		
	Ommered.	ŀ	x 40 mL Vial	-		L Ferrous	x 60 mL metals (I	HNO <sub>3</sub> )			Bore volume calculation	n, bore condition, fate	of tubing, redox of	orrection etc.
		- 1	x 40 mL Vial	1 (H <sub>2</sub> SO	4) x 100 r	nl. Amber	x 250 mL Plastic	_			Background	25 -	2 2	
														9
	2			App	proval and Distribu	ution								
11			7/8 Date	3/1	8	Vsickey	c W		1//	1/10	121 2 2001	2 2	1 11	
Fieldwork	Staff Signature	9	Date		3)	Checker Na	ame and Signat	ure	_ <u></u>	ate	LEL -> 20.9-0	2,2	Citts	0 H25 0,
	-19		14/11/	18						rech	-WIII need -Used som	chain	- 1-	
Project f	Manager Signat	ture	Date		Distrib	ution: Project C	entral File				-Used	STOPPING	atter 6	pener.

ANZ

# FQM - Groundwater Sampling and Purging Record

											Bore ID:	In	NOI
Project Name:		TRL-K	PF/10 Pro	ject Number:	6058	34690/1	1-2	PM Name:		SEAN HUGDENS	- MO(4-10	7/0	110
Client:	7	TRC	Pro	ject Location:		- WWT		Fieldwork Staff:		RJ	Well Development or	Well Sam	nling Event (circle)
		neral Bore	Information			ameter Info.		Decontamination	i I	Sampling Method		vdrasleeve	
Date of GW Le			Bore Radius (mm):		Chem Kit Seria	l No.:		Decontaminate	d F	Low Flow Pump rate:	Hydrasleeve Size:	, and a second	Monitoring
Depth to GW (			Screen Interval (m)		Chem Kit Mode	el:		Dedicated Dedicated	7	Intake depth:	Hydrasleeve Type:		sequence followed (pumber in order):
Bore Depth (m			Casing Radius (mm	1):	Corrected Rec	fox: Y / N		Disposable	1	■ Bailer		-pvc):	Gauging
Depth to Produ	ict (m-pvc):		Cover Type (gatic/s	tick up):	(The correction to	o apply is probe de		Other (specify)	_	Peristaltic Pump Waterra	Hydrasleeve Install		Hydrasleeve in
Product Thickn	ess (m):		Bore Locked (YES/	NO):	NAME OF TAXABLE PARTY.	thod: 🗖 Dow		/	$\overline{}$	Other (specify)	Sampling Start Time	1000000	Hydrasleeve out
			Key Type (if applica	ble):		Retri	eved	/	1	GRAB SAMPLE		0,	Parameters
Calculated bo	re volume (L)	:-	Includes/ exclude:	s bore annulus (d	circle) —	# purge volum	es remo	oved:	_	otal purged volume (L):			r drameters
								Parameters	-	star pargoa volunie (L).			
Time	Cumulative Vo Removed (L)		Pump Pate	(ppm or mg/L)	E.C. (mS/cm or uS/cm)	рН		dox nV) Temp	°C		Odour, Colour, Turbidit	y	
10:45				5.64	436.9	6.82	29	30 16.	7	1-2 NTU			
										1 1 1	-		
				-					_				
		1							_				
		-		-									
									_				
		+-											
					·								
	- 1	Acceptable	Parameter Range	± 10%	±3%	± 0.05	± 10	0 mV ± 0.2	°C	+10	% turbidity (if using a turbidity	( motos)	
Analyt	es Sampled			Bottles Col	lected			QA/QC Informat		1.0	Field Commets	y meter)	
Field Filtered:	Unfiltered	d:	× 40 mL Vial (HC	T)   x 60 x	nL Ferrous	x 60 mL metals (H	NO.			Personal una calculati	CONTRACTOR CONTRACTOR CONTRACTOR		
	1		x 40 mL Vial (H <sub>2</sub>		mL Amber	x 250 mL Plastic	(403)				on, bore condition, fate of tub		Z. To-Theoretic March
			1	X 100	IIIL AIIIQEI	x 250 mL Plastic	$\dashv$			SAMPLE N	1W01 -	EFFLO	VENT
							$\dashv$				S	AMPL	E
		1178 1178		approval and Distril	oution					0000000 70	urar -		1 200
1	2				Vseky	w-		14/11	/1	SAMPLE TAI	KEN AT I	FIRST	STAGE
Fieldwo	rk Staff Signa	iture	7/8// Date	-		me and Signati	ıre			OF FLOW			
19/2	1		14/11/18				W.S	Succ					
Projec	ct Manager Sig	gnature	Date	Distri	bution: Project Co	entral File							

INPLUENT

Project Name:	7	RO	PAJ	Projec	t Number:	1000	84690	110	200				Bore ID		n	W02
Client:		TRL			t Location:				-	lame:		SEAN HUDGENS	100,000,000,000	THE COURSE OF TH	71	8/18
	Gen	eral Bore	Information	riojee	e Education,		C WW i			work Staff:	_	RJ	Well D	evelopment or (	Well San	npling Event (circle)
Date of GW Le	evel:	/	Bore Radius (r	nm):	/	Chem Kit Seri	The second second second			contamination	_	Sampling Method		Hyd	drasleev	e into.
Depth to GW (	m-pvc):		Screen Interva		/	Chem Kit Mod	72.075881.1	-	FI	Decontaminated	1'	Low Flow Pump rate:	_	ydrasleeve Size:		Monitoring sequence followed
Bore Depth (m	i-pvc):		Casing Radius	(mm):		Corrected Re				Dedicated	$\vdash$	Intake depth:	-	ydrasleeve Type:		(number in order):
Depth to Produ	uct (m-pvc):		Cover Type (g	atic/sticl	k up)					Disposable	-	Bailer F Hydraslee		ampling Depth (m-p		Gauging
Product Thickr	ness (m):		Bore Locked (			Parameter me	to apply is probe de	ependent)	11	Ofher (specify)		Peristaltic Pump Waterra	Hy	vdrasleeve Install ti	me:	Hydrasleeve in
			Key Type (if ap			r arameter mit	Retri		/		F	Other (specify)	Sa	ampling Start Time:		Hydrasleeve out
Calculated bo	ore volume (L):	_	Includes/ excl		7.1	oirolo)			_		┖	6RAB				Parameters
			Thread door CAC	uues bi	ore armulus (c	arcie) —	# purge volum	THE RESERVE OF THE PERSON NAMED IN	THE REAL PROPERTY.	THE RESIDENCE OF THE PARTY OF T	То	tal purged volume (L):	_			
Time	Cumulative Vol	SWL			00	E.C.	vvater		_	rameters	_					
Time	Removed (L)	(m-pv	Dumn 6	Rate	(ppm or mg/L)	(mS/cm or μS/cm)	рН		dox nV)	Temp °(	С		Odour	r, Colour, Turbidity		
10:59					5.68	6 75	7.73	18.	3	17.2	2	92.0 N	TU			
													-		_	
								-	-		_					
				-					_							
		-	_	-												
															_	
											_		_			
											_					2)
				-						_						
			_	_												
				_												
Amalia			Parameter Ra	nge:	± 10%	± 3%	± 0.05	± 10	mV	± 0.2 °C		± 109	% turbidity	(if using a turbidity m	neter\	
	es Sampled fo				Bottles Coll	ected			QA	/QC Informatio	n		100	d Commets	iotor)	
Field Filtered:	Unfiltered:		x 40 mL Vial	(HCI)	x 60 m	L Ferrous	x 60 mL metals (HI	NO <sub>3</sub> )			_	Bore volume calculation		H-11000	and and	
		- 1	x 40 mL Vial	(H <sub>2</sub> SO <sub>4</sub> )	x 100 r	mL Amber	x 250 mL Plastic									
		- 1										SAMPLE WWW. SAMPLE TAI ACCES GRA	02	-> 15	AMI	RE
			William See	Appro	oval and Distrib	ution			_			SAMPLE TA	KEN	/ FOA	n	0.5
an	-		7/8		,	Victor	to-			14/11/15		ACCED ADD	17-	, NO!	11	BELOW
Fieldwor	k Staff Signatu	ire	Date		-	-	me and Signatu	ro	_	14/11/18		UK M	10,			
	15		14/11/1	. 8		Januario Ha	and orginatu			Date						
Projec	t Manager Sign	ature	Date	_	Dist-Ib	utlani Desis i A	and the									
					Distrib	ution: Project Ce	entral File									

# Appendix C

Laboratory Analytical Reports



AsureQuality Limited | 1C Quadrant Drive | Waiwhetu | Lower Hutt 5010 | Wellington | New Zealand PO Box 31242 | Lower Hutt 5040 | Wellington | New Zealand t. +64 4 570 8800 | e. cswellington@asurequality.com | w. www.asurequality.com Global Experts in Food Assurance

Certificate of Analysis

**Submission Reference: TRC-PFAS-2018** 

**Final Report** 

PO Number: 73494

Sean Hudgens **AECOM Consulting Services - Wellington** PO Box 27277 Wellington 6141 **New Zealand** 

Report Issued: 02-Oct-2018 AsureQuality Reference: 18-213312b Sample(s) Received: 08-Aug-2018 08:15

### **Comments**

The results for AsureQuality Reference 18-213312b were previously reported under AsureQuality Reference 18-201033 & 18-213312 in report numbers 1211355 & 1220922. The reproduction report has been issued at the customer's request.

### Results

The tests were performed on the samples as received.

ustomer Sample Name: GND2285			AsureQuality ID: 18-2133
ample Condition: Acceptable			
Test	Result	Unit	Method Reference
oly- and Perfluorinated Alkyl Substances (PFAS)	in Water		
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.019	μg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
PFUnDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	97	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	108	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	108	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	NR	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	73	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	113	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	108	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	114	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	118	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	110	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	104	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	87	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	99	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	109	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	116	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	123	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	122	%	AsureQuality Method (LC-MS/MS)
WIO.ZF 13	122	/6	Astregularity Metriou (EC-MS/MS)
ustomer Sample Name: GND2677			AsureQuality ID: 18-213312-
ample Condition: Acceptable	_		
Test	Result	Unit	Method Reference
oly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			, ,
PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L 	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.0087	μg/L 	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards		0/	Assert Oscalita Mathead (LO MO/MO)
M3PFBS	86	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	124	%	AsureQuality Method (LC-MS/MS)
M4PFBA	61	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	87	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	86	%	AsureQuality Method (LC-MS/MS)
MPFHpA	87	%	AsureQuality Method (LC-MS/MS)
M8PFOA	85	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M6PFDA	116	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	156 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	100	%	AsureQuality Method (LC-MS/MS)
MPFOSA	133	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	146	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	134	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	186 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	166 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	99	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			
Customer Sample Name: GND2740			AsureQuality ID: 18-213312-3
Sample Condition: Acceptable			
Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	114	%	AsureQuality Method (LC-MS/MS)
M8PFOS	150	%	AsureQuality Method (LC-MS/MS)
M4PFBA	85	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	99	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	117	%	AsureQuality Method (LC-MS/MS)
M6PFDA	144	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFTeDA			
	107	%	AsureQuality Method (LC-MS/MS)
MPFOSA	142	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	156 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	153 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	130	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	120	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	126	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	87	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	126	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			
stomer Sample Name: GND0508			AsureQuality ID: 18-213312
ample Condition: Acceptable			
Test	Result	Unit	Method Reference
	Nosuit	- Jint	ourou recionos
ly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L 	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	< 0.0010	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.0013	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards M3PFBS	93	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	127	%	
		%	AsureQuality Method (LC-MS/MS)
M4PFBA	64		AsureQuality Method (LC-MS/MS)
M5PFPeA	94	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	92	%	AsureQuality Method (LC-MS/MS)
MPFHpA	94	%	AsureQuality Method (LC-MS/MS)
M8PFOA	89	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	130	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	155 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFTeDA	128	%	AsureQuality Method (LC-MS/MS)
MPFOSA	138	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	135	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	130	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	174 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	161 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	105	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			

Customer Sample Name: SW01 AsureQuality ID: 18-213312-5

Sample Description: Leachate water - landfill

Sample Condition: Acceptable

Test	Result	Unit	Method Reference
oly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFBS *	0.37	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	0.031	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.12	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	0.15	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	0.028	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	0.049	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	0.077	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	0.23	μg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.41	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	0.080	μg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.24	μg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSA-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	112	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	113	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	NR	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	76	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	104	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	116	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	116	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	111	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	112	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	108	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	108	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	106	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	120	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	113	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	113	%	AsureQuality Method (LC-MS/MS)
	151 (R)		
M4:2FTS *	. , ,	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	214 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	123	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			
stomer Sample Name: QAQC01			AsureQuality ID: 18-213312
ample Condition: Acceptable			
Test	Result	Unit	Method Reference
ly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	Astregularity Method (LC-M5/M5)
mono-PFHxS (1) L-PFHxS (1)	<0.0010	μg/L μg/L	AsureQuality Method (LC-MS/MS)  AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides	-0.025	P9/L	/ loar-equality method (Le me/me/
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids		7.0	
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	95	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS	137	%	AsureQuality Method (LC-MS/MS)
M4PFBA	79	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	96	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	95	%	AsureQuality Method (LC-MS/MS)
MPFHpA	95	%	AsureQuality Method (LC-MS/MS)
M8PFOA	95	%	AsureQuality Method (LC-MS/MS)
M9PFNA	107	%	AsureQuality Method (LC-MS/MS)
M6PFDA	130	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	157 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	122	%	AsureQuality Method (LC-MS/MS)
MPFOSA	120	%	AsureQuality Method (LC-MS/MS)
INIT I OOA	IZU	70	Asurequality Methou (LC-Mo/Mo)

Test	Result	Unit	Method Reference
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	148	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	155 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	138	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	132	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	121	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	80	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	113	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			
sustomer Sample Name: QAQC02			AsureQuality ID: 18-213312
sample Condition: Acceptable			•
Test	Result	Unit	Method Reference
oly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
. , ,	<0.0010		
Total PFOS (7)		μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids	<0.0050	//	AguraQuality Mathad / LC MC/MC\
PFBA PFPeA	<0.0050 <0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)  AsureQuality Method (LC-MS/MS)
PFHpA		μg/L	, , ,
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L "	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L 	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	μg/L 	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L 	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	μg/L 	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			

Test	Result	Unit	Method Reference
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	99	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	103	%	AsureQuality Method (LC-MS/MS)
M8PFOS	116	%	AsureQuality Method (LC-MS/MS)
M4PFBA	101	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	97	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	96	%	AsureQuality Method (LC-MS/MS)
MPFHpA	98	%	AsureQuality Method (LC-MS/MS)
M8PFOA	93	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	114	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	113	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	110	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	59	%	AsureQuality Method (LC-MS/MS)
MPFOSA	133	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	119	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	141	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	135	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	77	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	101	%	AsureQuality Method (LC-MS/MS)
ustomer Sample Name: QAQC03			<b>AsureQuality ID:</b> 18-213312-
ample Condition: Acceptable			, sourcedainty IDT 10 210012
Test	Result	Unit	Method Reference
	1100011	<u> </u>	
bly- and Perfluorinated Alkyl Substances (PFAS) in Water			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010		AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
		μg/L	, , ,
mono-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L 	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Total PFOS (7)	<0.0010	μg/L	AsuraQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L 	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids	-0.0050		Access Occasión Martha et (I.O. MO(MO)
PFBA PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L "	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L 	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L 	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L 	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.0017	μg/L 	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards	400	0/	A
M3PFBS	128	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	136	%	AsureQuality Method (LC-MS/MS)
M8PFOS	165 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	133	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	124	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	122	%	AsureQuality Method (LC-MS/MS)
MPFHpA	128	%	AsureQuality Method (LC-MS/MS)
M8PFOA	125	%	AsureQuality Method (LC-MS/MS)
M9PFNA	137	%	AsureQuality Method (LC-MS/MS)
M6PFDA	170 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	150	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	104	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	70	%	AsureQuality Method (LC-MS/MS)
MPFOSA	73	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	150	%	AsureQuality Method (LC-MS/MS)
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Test	Result	Unit	Method Reference
DNEtFOSE	18 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	35	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	129	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	163 (R)	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			
ustomer Sample Name: QAQC04			AsureQuality ID: 18-213312-9
ample Description: Leachate water - landfill			7 Caroquany 121 10 2 100 12 0
ample Condition: Acceptable			
Test	Result	Unit	Method Reference
bly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFBS *	0.38	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010		
	0.036	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *		μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.12	μg/L 	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	0.16	μg/L 	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	0.028	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	0.046	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	0.074	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	0.23	μg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	0.11	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.36	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	0.086	μg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.25	μg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides		7.0	, , , , , , , , , , , , , , , , , , , ,
PFOSA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids	-		, , , , , , , , , , , , , , , , , , , ,
NEtFOSAA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<b>-0.10</b>	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols	<0.10	µ9/∟	rical o quality motiliou (20 mormo)
1 Officoroccial focular factorial focular focu	<0.10	μу/∟	rical equality method (20 method)
NEtFOSE-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Telomere Sulfonic acids			
4:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	109	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	109	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	NR	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	78	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	108	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	112	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	111	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	109	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	104	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	106	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	107	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	117	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	117	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	113	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	108	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	145	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	207 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	111	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			

Customer Sample Name: QAQC05 AsureQuality ID: 18-213312-10

Sample Description: Leachate water - landfill

Sample Condition: Acceptable

Report Number: 1256812

Test	Result	Unit	Method Reference
oly- and Perfluorinated Alkyl Substances (PFAS)	in Water		
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	102	%	AsureQuality Method (LC-MS/MS)
M8PFOS	123	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	96	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	94	%	AsureQuality Method (LC-MS/MS)
MPFHpA	98	%	AsureQuality Method (LC-MS/MS)
M8PFOA	92	%	AsureQuality Method (LC-MS/MS)
M9PFNA	100	%	AsureQuality Method (LC-MS/MS)
M6PFDA	121	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	139	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	157 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	86	%	AsureQuality Method (LC-MS/MS)
MPFOSA	139	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	135	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	140	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	147	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	142	%	AsureQuality Method (LC-MS/MS)
Diffinor GOE	1 74	/3	/ Journal of the first f

Test	Result	Unit	Method Reference
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	75	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	109	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			
customer Sample Name: QAQC06			<b>AsureQuality ID:</b> 18-213312-1
ample Description: Leachate water - QAQC			•
sample Condition: Acceptable			
Test	Result	Unit	Method Reference
oly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids		7.5	
PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
6:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	129	%	AsureQuality Method (LC-MS/MS)
M4PFBA	89	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	90	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	92	%	AsureQuality Method (LC-MS/MS)
M8PFOA	90	%	AsureQuality Method (LC-MS/MS)
M9PFNA	99	%	AsureQuality Method (LC-MS/MS)
M6PFDA	122	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	141	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	108	%	AsureQuality Method (LC-MS/MS)
MPFOSA	135	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	145	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	141	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	169 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	149	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	74	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	94	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			

Customer Sample Name: SW02 AsureQuality ID: 18-213312-13

**Sample Description:** Leachate water **Sample Condition**: Acceptable

Test	Result	Unit	Method Reference
oly- and Perfluorinated Alkyl Substances (PFAS) in	n Water		
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.014	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	0.014	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	0.015	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	0.016	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	0.031	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	0.045	μg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Perfluoroalkylcarboxylic acids			
PFBA *	NR	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.045	μg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	97	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	109	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	108	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	NR	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	81	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	104	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	108	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	104	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	103	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	109	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	107	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	100	% %	AsureQuality Method (LC-MS/MS)
M4:2FTS *	108	%	
			AsureQuality Method (LC-MS/MS)
M6:2FTS *	125	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M8:2FTS *	106	%	AsureQuality Method (LC-MS/MS)
ustomer Sample Name: GND1723			AsureQuality ID: 18-213312-14
ample Condition: Acceptable			
Test	Result	Unit	Method Reference
oly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050		AsureQuality Method (LC-MS/MS)  AsureQuality Method (LC-MS/MS)
PFDS *		μg/L	
	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids PFBA *	<0.20	ug/l	AcuraQuality Mathad (LC MS/MS)
PFPeA *	<0.20	μg/L	AsureQuality Method (LC-MS/MS)  AsureQuality Method (LC-MS/MS)
PFHxA *		µg/L	
	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	103	%	AsureQuality Method (LC-MS/MS)

AsureQuality ID: 18-213312-16

Test	Result	Unit	Method Reference
M3PFHxS *	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	107	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	99	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	104	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	102	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	95	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	104	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	95	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	91	%	AsureQuality Method (LC-MS/MS)

**Customer Sample Name:** Duplicate of 18-213312-3 **Sample Description:** AECOM 18-213312-3 duplicate

Sample Condition: Acceptable

Test	Result	Unit	Method Reference
ly- and Perfluorinated Alkyl Substances (PFAS)	) in Water		
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			·
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	93	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	102	%	AsureQuality Method (LC-MS/MS)
M8PFOS	116	%	AsureQuality Method (LC-MS/MS)
M4PFBA	82	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	95	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	96	%	AsureQuality Method (LC-MS/MS)
MPFHpA	96	%	AsureQuality Method (LC-MS/MS)
M8PFOA	95	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	121	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	130	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	112	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	69	%	AsureQuality Method (LC-MS/MS)
MPFOSA	142	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	135	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	153 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	148	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	77	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	104	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			Laam, mana (20 mormo)
TV = TOOGVELY OUTSIDE METHOD IIIIIIS			

Customer Sample Name: BB01 AsureQuality ID: 18-201033-12

Sample Description: 'BioBoost' Garden Fertiliser Product (Heat-treated Biosolids - Commercial compost)

Sample Condition: Acceptable Sampled Date: 07-Aug-2018

Test	Result	Unit	Method Reference
oly and Perfluorinated Alkyl Substances (PFAS	s) in Soil, Sediment and Biosolids		
Perfluoroalkylsulfonic acids			
PFPrS *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFBS *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	0.0082	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	0.0082	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	0.0082	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFNS *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFDS *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.0050	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFHxA *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFOA *	0.0011	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFNA *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFDA *	0.0030	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFDoDA *	0.0013	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)

PFTDA*	Test	Result	Unit	Method Reference
PFTEDA*         < 0.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS) weight)           PFOSA*         < 0.0010	PFTrDA *	<0.0010		AsureQuality Method (LC-MS/MS)
Perfluorocotaneoulfonamidos         PECOSA*         <0.0010         mg/kg (dry weight) weight) (but weight)         AsureQuality Method (LC-MS/MS) (but weight)           NEIFOSA-M*         <0.0010	PFTeDA *	<0.0010		AsureQuality Method (LC-MS/MS)
PFOSA *			weight)	
NEIFOSA-M				
NMEFOSA-M *   -0.0010   mg/kg (dry weight)	PFOSA *	<0.0010		AsureQuality Method (LC-MS/MS)
NMeFOSAM*         q.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS) weight)           Perfluorooctanesulfonamidoscetic acids         0.0038         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS) weight)           NIMEFOSAA*         0.0029         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS) weight)           Perfluorooctanesulfonamidoethanols         v.0.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           NMeFOSE-M*         <0.0010	NEtFOSA-M *	<0.0010		AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids         Perfluorooctanesulfonamidoacetic acids         mg/kg (dry burlet)         AsureQuality Method (LC-MS/MS)           NEFOSAA*         0.0029         mg/kg (dry burlet)         AsureQuality Method (LC-MS/MS)           Perfluorooctanesulfonamidoathanols         mg/kg (dry burlet)         AsureQuality Method (LC-MS/MS)           PERFLOSE-M*         *0.0010         mg/kg (dry burlet)         AsureQuality Method (LC-MS/MS)           PERFLOSE-M*         *0.0010         mg/kg (dry burlet)         AsureQuality Method (LC-MS/MS)           ************************************	NMeFOSA-M *	<0.0010	mg/kg (dry	AsureQuality Method (LC-MS/MS)
NEIFOSAA*         0.0038         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           NIMEFOSAA*         0.0029         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           Perfluorooctanesulfonamidoethanols         VERIFOSE-M*         40.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           NIMEFOSE-M*         40.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           Perfluorooctanesulfonia exids         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           MSPFBS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           MSPFBS*         94         %         AsureQuality Method (LC-MS/MS)           MSPFBS*         94         %         AsureQuality Method (LC-MS/MS)           MSPFPBA*	Perfluorooctanesulfonamidoacetic acids		weight)	
NMEFOSAA*         0.0029         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           Perfluorooctanesulfonamidoethanols         Vo.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           NEFOSE-M*         2.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           Perfluorooctanesulfonamidoethanols         Vo.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           NEFOSE-M*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           6:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         SureQuality Method (LC-MS/MS)           M3FFBS*         57         %         AsureQuality Method (LC-MS/MS)           M3FFBS*         94         %         AsureQuality Method (LC-MS/MS)           M4FFBA*         34         %         AsureQuality Method (LC-MS/MS)           M5FFPHA*         85         %         AsureQuality Method (LC-MS/MS)		0.0038		AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols         Co.0010         mg/kg (dry veight)         AsureQuality Method (LC-MS/MS)           NMeFOSE-M*         <0.0010	NMeFOSAA *	0.0029	mg/kg (dry	AsureQuality Method (LC-MS/MS)
NETFOSE-M*         <0.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           NMeFOSE-M*         <0.0010	Perfluorooctanesulfonamidoethanols		weight)	
NMeFOSE-M *         <0.0010         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS) weight)           Telomere Sufforic acids         WR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS) weight)           6:2 FTS *         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS) weight)           8:2 FTS *         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           Internal Standards         F         %         AsureQuality Method (LC-MS/MS)           M3PFBS *         57         %         AsureQuality Method (LC-MS/MS)           M3PFHxS *         94         %         AsureQuality Method (LC-MS/MS)           M8PFOS *         45         %         AsureQuality Method (LC-MS/MS)           M5PFPA *         45         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         103         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103 <t< td=""><td></td><td>&lt;0.0010</td><td></td><td>AsureQuality Method (LC-MS/MS)</td></t<>		<0.0010		AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids           4:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           6:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS*         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           Internal Standards           M3PFBS*         57         %         AsureQuality Method (LC-MS/MS)           M3PFHXS*         94         %         AsureQuality Method (LC-MS/MS)           M8PFOS*         94         %         AsureQuality Method (LC-MS/MS)           M4PFBA*         34         %         AsureQuality Method (LC-MS/MS)           M5PFPA*         45         %         AsureQuality Method (LC-MS/MS)           M5PFHXA*         63         %         AsureQuality Method (LC-MS/MS)           M8PFOA*         103         %         AsureQuality Method (LC-MS/MS)           M8PFOA*         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA*         108         %         AsureQuality Method (LC-MS/MS)           M6PFDA*         111         %         AsureQuality Method (LC-MS/MS)	NMeFOSE-M *	<0.0010	mg/kg (dry	AsureQuality Method (LC-MS/MS)
weight)           6:2 FTS *         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS *         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           Internal Standards           M3PFBS *         57         %         AsureQuality Method (LC-MS/MS)           M3PFHx8 *         94         %         AsureQuality Method (LC-MS/MS)           M8PFOS *         94         %         AsureQuality Method (LC-MS/MS)           M4PFBA *         34         %         AsureQuality Method (LC-MS/MS)           M5PFPeA *         45         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         103         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUNDA *         111         %         AsureQuality Method (LC-MS/MS)	Telomere Sulfonic acids		0 /	
6:2 FTS *         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           8:2 FTS *         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           Internal Standards           M3PFBS *         57         %         AsureQuality Method (LC-MS/MS)           M3PFHxS *         94         %         AsureQuality Method (LC-MS/MS)           M8PFOS *         94         %         AsureQuality Method (LC-MS/MS)           M4PFBA *         34         %         AsureQuality Method (LC-MS/MS)           M5PFPeA *         45         %         AsureQuality Method (LC-MS/MS)           M5PFHxA *         63         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M9PFNA *         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUNDA *         111         %         AsureQuality Method (LC-MS/MS)	4:2 FTS *	NR		AsureQuality Method (LC-MS/MS)
8:2 FTS *         NR         mg/kg (dry weight)         AsureQuality Method (LC-MS/MS)           Internal Standards           M3PFBS *         57         %         AsureQuality Method (LC-MS/MS)           M3PFHxS *         94         %         AsureQuality Method (LC-MS/MS)           M8PFOS *         94         %         AsureQuality Method (LC-MS/MS)           M4PFBA *         34         %         AsureQuality Method (LC-MS/MS)           M5PFPeA *         45         %         AsureQuality Method (LC-MS/MS)           M5PFHxA *         63         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M9PFNA *         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUDDA *         111         %         AsureQuality Method (LC-MS/MS)	6:2 FTS *	NR		AsureQuality Method (LC-MS/MS)
Internal Standards           M3PFBS *         57         %         AsureQuality Method (LC-MS/MS)           M3PFHxS *         94         %         AsureQuality Method (LC-MS/MS)           M8PFOS *         94         %         AsureQuality Method (LC-MS/MS)           M4PFBA *         34         %         AsureQuality Method (LC-MS/MS)           M5PFPeA *         45         %         AsureQuality Method (LC-MS/MS)           M5PFHxA *         63         %         AsureQuality Method (LC-MS/MS)           MPFHpA *         85         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M9PFNA *         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUDDA *         111         %         AsureQuality Method (LC-MS/MS)	8:2 FTS *	NR	mg/kg (dry	AsureQuality Method (LC-MS/MS)
M3PFHxS*         94         %         AsureQuality Method (LC-MS/MS)           M8PFOS*         94         %         AsureQuality Method (LC-MS/MS)           M4PFBA*         34         %         AsureQuality Method (LC-MS/MS)           M5PFPeA*         45         %         AsureQuality Method (LC-MS/MS)           M5PFHxA*         63         %         AsureQuality Method (LC-MS/MS)           MPFHpA*         85         %         AsureQuality Method (LC-MS/MS)           M8PFOA*         103         %         AsureQuality Method (LC-MS/MS)           M9PFNA*         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA*         108         %         AsureQuality Method (LC-MS/MS)           M7PFUnDA*         111         %         AsureQuality Method (LC-MS/MS)	Internal Standards		gy	
M8PFOS *         94         %         AsureQuality Method (LC-MS/MS)           M4PFBA *         34         %         AsureQuality Method (LC-MS/MS)           M5PFPeA *         45         %         AsureQuality Method (LC-MS/MS)           M5PFHxA *         63         %         AsureQuality Method (LC-MS/MS)           MPFHpA *         85         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M9PFNA *         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUnDA *         111         %         AsureQuality Method (LC-MS/MS)		57	%	AsureQuality Method (LC-MS/MS)
M4PFBA *       34       %       AsureQuality Method (LC-MS/MS)         M5PFPeA *       45       %       AsureQuality Method (LC-MS/MS)         M5PFHxA *       63       %       AsureQuality Method (LC-MS/MS)         MPFHpA *       85       %       AsureQuality Method (LC-MS/MS)         M8PFOA *       103       %       AsureQuality Method (LC-MS/MS)         M9PFNA *       113       %       AsureQuality Method (LC-MS/MS)         M6PFDA *       108       %       AsureQuality Method (LC-MS/MS)         M7PFUnDA *       111       %       AsureQuality Method (LC-MS/MS)	M3PFHxS *	94	%	AsureQuality Method (LC-MS/MS)
M5PFPeA*       45       %       AsureQuality Method (LC-MS/MS)         M5PFHxA*       63       %       AsureQuality Method (LC-MS/MS)         MPFHpA*       85       %       AsureQuality Method (LC-MS/MS)         M8PFOA*       103       %       AsureQuality Method (LC-MS/MS)         M9PFNA*       113       %       AsureQuality Method (LC-MS/MS)         M6PFDA*       108       %       AsureQuality Method (LC-MS/MS)         M7PFUnDA*       111       %       AsureQuality Method (LC-MS/MS)	M8PFOS *	94	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *         63         %         AsureQuality Method (LC-MS/MS)           MPFHpA *         85         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M9PFNA *         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUnDA *         111         %         AsureQuality Method (LC-MS/MS)	M4PFBA *	34	%	AsureQuality Method (LC-MS/MS)
MPFHpA *         85         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M9PFNA *         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUnDA *         111         %         AsureQuality Method (LC-MS/MS)	M5PFPeA *	45	%	AsureQuality Method (LC-MS/MS)
MPFHpA *         85         %         AsureQuality Method (LC-MS/MS)           M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M9PFNA *         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUnDA *         111         %         AsureQuality Method (LC-MS/MS)	M5PFHxA *	63	%	AsureQuality Method (LC-MS/MS)
M8PFOA *         103         %         AsureQuality Method (LC-MS/MS)           M9PFNA *         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUnDA *         111         %         AsureQuality Method (LC-MS/MS)				
M9PFNA *         113         %         AsureQuality Method (LC-MS/MS)           M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUnDA *         111         %         AsureQuality Method (LC-MS/MS)	M8PFOA *	103	%	
M6PFDA *         108         %         AsureQuality Method (LC-MS/MS)           M7PFUnDA *         111         %         AsureQuality Method (LC-MS/MS)				
M7PFUnDA * 111 % AsureQuality Method (LC-MS/MS)				
The state of the s				, ,
MPFTeDA * 219 (R) % AsureQuality Method (LC-MS/MS)				
MPFOSA * 64 % AsureQuality Method (LC-MS/MS)				
DNEtFOSA * 15 (R) % AsureQuality Method (LC-MS/MS)				
DNMeFOSA * 47 % AsureQuality Method (LC-MS/MS)				
DNEtFOSAA * 169 (R) % AsureQuality Method (LC-MS/MS)				
DNEtFOSE * 12 (R) % AsureQuality Method (LC-MS/MS)  DNMcFOSE * 22 % AsureQuality Method (LC-MS/MS)				
DNMeFOSE * 32 % AsureQuality Method (LC-MS/MS)  M4/2FTS * 32 % AsureQuality Method (LC-MS/MS)	DININELOSE	32	70	AsureQuality ivietnod (LC-M5/M5)
		070 (5)	0/	A sumo Overlite Martin and the AAO (AAO)
M6:2FTS * 455 (R) % AsureQuality Method (LC-MS/MS)	M4:2FTS *	379 (R)	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M8:2FTS *	325 (R)	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

# **QC** Results

Relates to sample(s) 18-201033-12

st	Result	Unit	Method Reference
y and Perfluorinated Alkyl Substances (PFAS) in Soil,	Sediment and Biosolids		
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	mg/kg (dry weight)	
Sum PFHxS+PFOS (1)	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	mg/kg (dry weight)	A
PFNA	<0.0010	mg/kg (dry weight)	A
PFDA	<0.0010	mg/kg (dry weight)	A
PFUnDA	<0.0010	mg/kg (dry weight)	
PFDoDA	<0.0010	mg/kg (dry weight)	A
PFTrDA	<0.0010	mg/kg (dry weight)	
PFTeDA	<0.0010	mg/kg (dry weight)	A 0 17 M (1 1 (1 0 M (1 M (1 M (1 M (1 M (1 M
Perfluorooctanesulfonamides		3 3 (1 ) 1 3 1	
PFOSA	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	mg/kg (dry weight)	
NMeFOSA-M	<0.0010	mg/kg (dry weight)	, , , , , , , , , , , , , , , , , , , ,
Perfluorooctanesulfonamidoacetic acids		3 3 ()9/	·
NEtFOSAA	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	mg/kg (dry weight)	A 0 111 M 11 L (1 0 M 0 M 0 )
Perfluorooctanesulfonamidoethanols		g.vg (dry worght)	. ,
NEtFOSE-M	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	mg/kg (dry weight)	

Telomere Sulfonic acids 4:2 FTS	-0.0043		AguraQuality Mathad (LC MC/MC)
	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	mg/kg (dry weight)	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	103	%	AsureQuality Method (LC-MS/MS)
M4PFBA	108	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	106	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	106	%	AsureQuality Method (LC-MS/MS)
M9PFNA	106	%	AsureQuality Method (LC-MS/MS)
M6PFDA	101	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	91	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	62	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	28 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	70	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	71	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	73	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	83	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

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 $Relates\ to\ sample(s)\ 18-213312-1,\ 18-213312-5,\ 18-213312-9,\ 18-213312-13,\ 18-213312-14$ 

	Unit	Method Reference
ater		
<0.050	μg/L	AsureQuality Method (LC-MS/MS)
<0.050	μg/L	AsureQuality Method (LC-MS/MS)
<0.050	μg/L	AsureQuality Method (LC-MS/MS)
<0.010	μg/L	AsureQuality Method (LC-MS/MS)
<0.010	μg/L	AsureQuality Method (LC-MS/MS)
<0.010	μg/L	AsureQuality Method (LC-MS/MS)
<0.010	μg/L	AsureQuality Method (LC-MS/MS)
<0.050	μg/L	AsureQuality Method (LC-MS/MS)
<0.010	μg/L	AsureQuality Method (LC-MS/MS)
<0.010	μg/L	AsureQuality Method (LC-MS/MS)
<0.010	μg/L	AsureQuality Method (LC-MS/MS)
<0.010	μg/L	AsureQuality Method (LC-MS/MS)
<0.010	μg/L	AsureQuality Method (LC-MS/MS)
	<0.050 <0.050 <0.050 <0.010 <0.010 <0.010 <0.010 <0.050 <0.010 <0.050 <0.010 <0.010 <0.010	<0.050 μg/L <0.050 μg/L <0.050 μg/L <0.050 μg/L <0.010 μg/L <0.010 μg/L <0.010 μg/L <0.010 μg/L <0.010 μg/L <0.010 μg/L <0.050 μg/L <0.010 μg/L <0.010 μg/L <0.010 μg/L <0.010 μg/L <0.010 μg/L

<b>Test</b>	Result	Unit	Method Reference
PFNS	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.20	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.050	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	108	%	AsureQuality Method (LC-MS/MS)
M8PFOS	106	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	108	%	AsureQuality Method (LC-MS/MS)
M9PFNA	104	%	AsureQuality Method (LC-MS/MS)
M6PFDA	108	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	105	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	102	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	98	%	AsureQuality Method (LC-MS/MS)
MPFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNMeFOSAA	107	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	103	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	97	%	AsureQuality Method (LC-MS/MS)

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 $Relates \ to \ sample(s) \ 18-213312-2, \ 18-213312-3, \ 18-213312-4, \ 18-213312-6, \ 18-213312-7, \ 18-213312-8, \ 18-213312-10, \ 18-213312-11, \ 18-213312-16$ 

st	Result	Unit	Method Reference
ly- and Perfluorinated Alkyl Substances (PFAS) in Wat	ter		
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)

Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	100	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	110	%	AsureQuality Method (LC-MS/MS)
M8PFOS	131	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA	126	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	150	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	168 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	173 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	120	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	132	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	172 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	140	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	132	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	110	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	108	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

# **Analysis Summary**

Wellington Laboratory			
Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Subs	stances (PFAS) in Water		
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Cameron Evans, Lauren Fleu

Cameron Evans, Lauren Fleury

AsureQuality Reference: 18-213312b Report Issued: 02-Oct-2018

Analysis Method Accreditation Authorised by

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

2 1 1 00 (0) Contollitudion determined doing the linear 1 1 00 Bonier standard (400-20

 $\label{eq:total_pfos} \textit{Total PFOS (7)} = \textit{The numerical sum of di-PFOS (5)}, \, \textit{mono-PFOS (5)}, \, \textit{and L-PFOS (5)}$ 

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample

Reported results are corrected for internal standard recovery

#### Poly and Perfluorinated Alkyl Substances (PFAS) in Soil, Sediment and Biosolids

DX-PFCS02, 03-SUITE\_B

AsureQuality Method (LC-MS/MS)

Not Accredited

Lisa Graham

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)  $\,$ 

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Any tests marked with \* are not accredited for specific matrices or analytes.

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable

Cameron Evans

Scientist

Lauren Fleury

Scientist

Lisa Graham

Scientist / Team Leader

graham

# **Accreditation**

Report Number: 1256812



AsureQuality Reference: 18-213312b Report Issued: 02-Oct-2018

# **Appendix**

# **Analyte LOR Summary**

Poly- and Perfluorinated Alkyl	Substances (PFAS) in Water -	AsureQuality Method (LC-MS/MS)

Analyte LOR (µg/L)

Listing applies to samples: 18-213312-1, 18-213312-13, 18-213312-14, 18-213312-5, 18-213312-9

Perfluoroa	kylsulfo	nic acids
------------	----------	-----------

PFPrS*	0.0010
PFBS*	0.0010
PFPeS*	0.0010
di-PFHxS (1)*	0.0010
mono-PFHxS (1)*	0.0010
L-PFHxS (1)*	0.0010
Total PFHxS (3)*	0.0010
PFHpS*	0.0010
di-PFOS (5)*	0.0010
mono-PFOS (5)*	0.0010
L-PFOS (5)*	0.0010
Total PFOS (7)*	0.0010
Sum PFHxS+PFOS (1)*	0.0010
PFNS*	0.0010
PFDS*	0.0010

## Perfluoroalkylcarboxylic acids

NR
0.0010
0.0010
0.0010
0.0010
0.0010
0.0010
0.0010
0.0010
0.0010
0.0010

# Perfluorooctanesulfonamides

 PFOSA\*
 0.0010

 NEtFOSA-M\*
 0.0010

 NMeFOSA-M\*
 0.0010

## Perfluorooctanesulfonamidoacetic acids

 NEtFOSAA\*
 0.0010

 NMeFOSAA\*
 0.0010

# Perfluorooctanesulfonamidoethanols

NEtFOSE-M\* 0.0010 NMeFOSE-M\* 0.0010

## Telomere Sulfonic acids

4:2 FTS\* 0.0010 6:2 FTS\* 0.0010 8:2 FTS\* 0.0010

 $Listing \ applies \ to \ samples: 18-213312-10, \ 18-213312-11, \ 18-213312-16, \ 18-213312-2, \ 18-213312-3, \ 18-213312-4, \ 18-213312-6, \ 18-213312-10,$ 

18-213312-7, 18-213312-8

PFPrS 0.0010 PFBS 0.0010

PFPeS	0.0010
di-PFHxS (1)	0.0010
mono-PFHxS (1)	0.0010
L-PFHxS (1)	0.0010
Total PFHxS (3)	0.0010
PFHpS	0.0010
di-PFOS (5)	0.0010
mono-PFOS (5)	0.0010
L-PFOS (5)	0.0010
Total PFOS (7)	0.0010
Sum PFHxS+PFOS (1)	0.0010
PFNS	0.0010
PFDS	0.0010
Perfluoroalkylcarboxylic acids	
PFBA	0.0010
PFPeA	0.0010
PFHxA	0.0010
PFHpA	0.0010
PFOA	0.0010
PFNA	0.0010
PFDA	0.0010
PFUnDA	0.0010
PFDoDA	0.0010
PFTrDA	0.0010
PFTeDA	0.0010
Perfluorooctanesulfonamides	
PFOSA	0.0010
NEtFOSA-M	NR
NMeFOSA-M	NR
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010
NMeFOSAA	0.0010
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.0010
NMeFOSE-M	0.0010
Telomere Sulfonic acids	
4:2 FTS	0.0010
6:2 FTS	0.0010
8:2 FTS	0.0010

# Poly and Perfluorinated Alkyl Substances (PFAS) in Soil, Sediment and Biosolids - AsureQuality Method (LC-MS/MS)

Analyte LOR (mg/kg (dry weight))

Listing applies to samples: 18-201033-12

# Perfluoroalkylsulfonic acids

PFPrS\* 0.0010 PFBS\* 0.0010 PFPeS\* 0.0010 di-PFHxS (1)\* 0.0010 0.0010 mono-PFHxS (1)\* L-PFHxS (1)\* 0.0010 Total PFHxS (3)\* 0.0010 PFHpS\* 0.0010

Perfluoroalkylcarboxylic acids	
PFDS*	0.0010
PFNS*	0.0010
Sum PFHxS+PFOS (1)*	0.0010
Total PFOS (7)*	0.0010
L-PFOS (5)*	0.0010
mono-PFOS (5)*	0.0010
di-PFOS (5)*	0.0010

#### Perfluoroalkylcarboxylic acids

PFBA\* 0.0010 PFPeA\* 0.0010 PFHxA\* 0.0010 PFHpA\* 0.0010 PFOA\* 0.0010 PFNA\* 0.0010 PFDA\* 0.0010 PFUnDA\* 0.0010 PFDoDA\* 0.0010 PFTrDA\* 0.0010 PFTeDA\* 0.0010

#### Perfluorooctanesulfonamides

 PFOSA\*
 0.0010

 NEtFOSA-M\*
 0.0010

 NMeFOSA-M\*
 0.0010

#### Perfluorooctanesulfonamidoacetic acids

NEtFOSAA\* 0.0010 NMeFOSAA\* 0.0010

## Perfluorooctanesulfonamidoethanols

 NEtFOSE-M\*
 0.0010

 NMeFOSE-M\*
 0.0010

# Telomere Sulfonic acids

4:2 FTS\* NR
6:2 FTS\* NR
8:2 FTS\* NR

# **Analyte Definitions**

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte Full Name

Listing applies to samples: 18-213312-1, 18-213312-13, 18-213312-14, 18-213312-5, 18-213312-9

# Perfluoroalkylsulfonic acids

PFPrS\* Perfluoro-1-propanesulfonic acid
PFBS\* Perfluoro-1-butanesulfonic acid
PFPeS\* Perfluoro-1-pentanesulfonic acid

 di-PFHxS (1)\*
 Total Perfluorodimethylbutane sulfonic acids

 mono-PFHxS (1)\*
 Total Perfluoromethylpentane sulfonic acids

 L-PFHxS (1)\*
 Linear Perfluorohexanesulfonic acid

 PFHpS\*
 Perfluoro-1-heptanesulfonic acid

di-PFOS (5)\* Total Perfluorodimethylhexane sulfonic acids mono-PFOS (5)\* Total Perfluoromethylheptane sulfonic acids L-PFOS (5)\* Linear Perfluoroctanesulfonic acid PFNS\* Perfluoro-1-nonanesulfonic acid PFDS\* Perfluoro-1-decanesulfonic acid

Perfluoroalkylcarboxylic acids

PFBA\* Perfluoro-n-butanoic acid

PFPeA\* Perfluoro-n-pentanoic acid PFHxA\* Perfluoro-n-hexanoic acid PFHpA\* Perfluoro-n-heptanoic acid PFOA\* Perfluoro-n-octanoic acid PFNA\* Perfluoro-n-nonanoic acid PFDA\* Perfluoro-n-decanoic acid PFUnDA\* Perfluoro-n-undecanoic acid PFDoDA\* Perfluoro-n-dodecanoic acid PFTrDA\* Perfluoro-n-tridecanoic acid PFTeDA\* Perfluoro-n-tetradecanoic acid

Perfluorooctanesulfonamides

PFOSA\* Perfluoro-1-octanesulfonamide

NEtFOSA-M\* N-ethylperfluoro-1-octanesulfonamide

NMeFOSA-M\* N-methylperfluoro-1-octanesulfonamide

Perfluorooctanesulfonamidoacetic acids

NEtFOSAA\* N-ethylperfluoro-1-octanesulfonamidoacetic acid

NMeFOSAA\* N-methylperfluoro-1-octanesulfonamidoacetic acid

Perfluorooctanesulfonamidoethanols

NEtFOSE-M\* 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M\* 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

Telomere Sulfonic acids

4:2 FTS\* 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS\* 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS\* 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid

Internal Standards

M3PFBS\* Perfluoro-1-[2,3,4-13C3]butanesulfonic acid M3PFHxS<sup>3</sup> Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid M8PFOS\* Perfluoro-1-[13C8]octanesulfonic acid M4PFBA\* Perfluoro-n-[1,2,3,4-13C4]butanoic acid M5PFPeA Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid M5PFHxA\* Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid MPFHpA\* Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid M8PFOA\* Perfluoro-n-[13C8]octanoic acid

M9PFNA\* Perfluoro-n-[13C9]nonanoic acid

M6PFDA\* Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA\* Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid

MPFDoDA\* Perfluoro-n-[1,2-13C2]dodecanoic acid MPFTeDA\* Perfluoro-n-[1,2-13C2]tetradecanoic acid MPFOSA\* Perfluoro-1-[13C8]octanesulfonamide DNEtFOSA\* N-ethyl-D5-perfluoro-1-octanesulfonamide DNMeFOSA\* N-methyl-D3-perfluoro-1-octanesulfonamide DNEtFOSAA\* N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid DNMeFOSAA\* N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid DNEtFOSE\* 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol DNMeFOSE\* 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol M4·2FTS 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid M6:2FTS\* 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid

Listing applies to samples: 18-213312-10, 18-213312-11, 18-213312-16, 18-213312-2, 18-213312-3, 18-213312-4, 18-213312-6,

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

18-213312-7, 18-213312-8 Perfluoroalkylsulfonic acids

M8:2FTS\*

PFPrS Perfluoro-1-propanesulfonic acid
PFBS Perfluoro-1-butanesulfonic acid
PFPeS Perfluoro-1-pentanesulfonic acid

 di-PFHxS (1)
 Total Perfluorodimethylbutane sulfonic acids

 mono-PFHxS (1)
 Total Perfluoromethylpentane sulfonic acids

 L-PFHxS (1)
 Linear Perfluorohexanesulfonic acid

 PFHpS
 Perfluoro-1-heptanesulfonic acid

di-PFOS (5)

Total Perfluorodimethylhexane sulfonic acids mono-PFOS (5)

Total Perfluoromethylheptane sulfonic acids L-PFOS (5)

Linear Perfluoroctanesulfonic acid

PFNS

Perfluoro-1-nonanesulfonic acid

PFDS

Perfluoro-1-decanesulfonic acid

Perfluoroalkylcarboxylic acids

Perfluoro-n-butanoic acid PFPeA Perfluoro-n-pentanoic acid PFHxA Perfluoro-n-hexanoic acid PFHpA Perfluoro-n-heptanoic acid PFOA Perfluoro-n-octanoic acid PFNA Perfluoro-n-nonanoic acid PFDA Perfluoro-n-decanoic acid PFUnDA Perfluoro-n-undecanoic acid PFDoDA Perfluoro-n-dodecanoic acid PFTrDA Perfluoro-n-tridecanoic acid PFTeDA Perfluoro-n-tetradecanoic acid

Perfluorooctanesulfonamides

PFOSA Perfluoro-1-octanesulfonamide

NEtFOSA-M N-ethylperfluoro-1-octanesulfonamide

NMeFOSA-M N-methylperfluoro-1-octanesulfonamide

Perfluorooctanesulfonamidoacetic acids

NEtFOSAA

N-ethylperfluoro-1-octanesulfonamidoacetic acid

NMeFOSAA

N-methylperfluoro-1-octanesulfonamidoacetic acid

Perfluorooctanesulfonamidoethanols

 NEtFOSE-M
 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol

 NMeFOSE-M
 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

Telomere Sulfonic acids

4:2 FTS1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid6:2 FTS1H,1H,2H,2H-perfluoro-1-octanesulfonic acid8:2 FTS1H,1H,2H,2H-perfluoro-1-decanesulfonic acid

Internal Standards

M9PFNA

Report Number: 1256812

M3PFBS Perfluoro-1-[2,3,4-13C3]butanesulfonic acid M3PFHxS Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid M8PFOS Perfluoro-1-[13C8]octanesulfonic acid M4PFBA Perfluoro-n-[1,2,3,4-13C4]butanoic acid M5PFPeA Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid M5PFHxA Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid MPFHpA Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid M8PFOA Perfluoro-n-[13C8]octanoic acid

M6PFDA Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid

Perfluoro-n-[13C9]nonanoic acid

MPFDoDA Perfluoro-n-[1,2-13C2]dodecanoic acid

MPFTeDA Perfluoro-n-[1,2-13C2]tetradecanoic acid

MPFOSA Perfluoro-1-[13C8]octanesulfonamide

DNEtFOSA N-ethyl-D5-perfluoro-1-octanesulfonamide

DNMeFOSA N-methyl-D3-perfluoro-1-octanesulfonamide

DNEtFOSAA N-methyl-D5-perfluoro-1-octanesulfonamidoacetic acid

DNMeFOSAA N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid

DNEtFOSE

2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol

DNMeFOSE

2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol

M4:2FTS

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid

M6:2FTS

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

M8:2FTS

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

## Poly and Perfluorinated Alkyl Substances (PFAS) in Soil, Sediment and Biosolids - AsureQuality Method (LC-MS/MS)

Analyte Full Name

Listing applies to samples: 18-201033-12

Perfluoroalkylsulfonic acids

PFPrS\* Perfluoro-1-propanesulfonic acid

PFBS\* Perfluoro-1-butanesulfonic acid

PFPeS\* Perfluoro-1-pentanesulfonic acid

di-PFHxS (1)\* Total Perfluorodimethylbutane sulfonic acids mono-PFHxS (1)\* Total Perfluoromethylpentane sulfonic acids L-PFHxS (1)\* Linear Perfluorohexanesulfonic acid PFHpS\* Perfluoro-1-heptanesulfonic acid

di-PFOS (5)\*
Total Perfluorodimethylhexane sulfonic acids mono-PFOS (5)\*
Total Perfluoromethylheptane sulfonic acids L-PFOS (5)\*
Linear Perfluoroctanesulfonic acid
PFNS\*
Perfluoro-1-nonanesulfonic acid
PFDS\*
Perfluoro-1-decanesulfonic acid

Perfluoroalkylcarboxylic acids

PFBA\* Perfluoro-n-butanoic acid PFPeA\* Perfluoro-n-pentanoic acid PFHxA\* Perfluoro-n-hexanoic acid PFHpA\* Perfluoro-n-heptanoic acid PFOA\* Perfluoro-n-octanoic acid PFNA\* Perfluoro-n-nonanoic acid PFDA\* Perfluoro-n-decanoic acid PFUnDA\* Perfluoro-n-undecanoic acid PFDoDA\* Perfluoro-n-dodecanoic acid PFTrDA\* Perfluoro-n-tridecanoic acid PFTeDA\* Perfluoro-n-tetradecanoic acid

Perfluorooctanesulfonamides

PFOSA\* Perfluoro-1-octanesulfonamide

NEtFOSA-M\* N-ethylperfluoro-1-octanesulfonamide

NMeFOSA-M\* N-methylperfluoro-1-octanesulfonamide

Perfluorooctanesulfonamidoacetic acids

NEtFOSAA\* N-ethylperfluoro-1-octanesulfonamidoacetic acid

NMeFOSAA\* N-methylperfluoro-1-octanesulfonamidoacetic acid

Perfluorooctanesulfonamidoethanols

NEtFOSE-M\*

2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol

NMeFOSE-M\*

2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

Telomere Sulfonic acids

4:2 FTS\*1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid6:2 FTS\*1H,1H,2H,2H-perfluoro-1-octanesulfonic acid8:2 FTS\*1H,1H,2H,2H-perfluoro-1-decanesulfonic acid

Internal Standards

M3PFBS\* Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS\* Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS\* Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA\* Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA\* Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid

AsureQuality Reference: 18-213312b Report Issued: 02-Oct-2018

Analyte Full Name

M5PFHxA\* Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA\* Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid
M8PFOA\* Perfluoro-n-[13C8]octanoic acid

M9PFNA\* Perfluoro-n-[13C9]nonanoic acid

M6PFDA\* Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA\* Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid

MPFDoDA\* Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA\* Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA\* Perfluoro-1-[13C8]octanesulfonamide

DNEtFOSA\* N-ethyl-D5-perfluoro-1-octanesulfonamide

DNMeFOSA\* N-methyl-D3-perfluoro-1-octanesulfonamide

DNEtFOSAA\*

N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid

N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid

N-methyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol

DNMeFOSE\*

2-(N-methyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol

M4:2FTS\*

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid

M6:2FTS\*

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

M8:2FTS\*

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

Any tests marked with \* are not accredited for specific matrices or analytes.

Report Number: 1256812

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable



# AsureQuality Food and Environmental Submission Form/Chain of Custody

				_	_	
<b>Customer Details</b>		Reporti	ng Details		AQ Project Referen	ice
Company Name:* AECOI	M NZ LTD	1	ults To:* SEAN.HUDGENS@AE	ECOM.COM	IAD use i7ei/1	
Contact Person:* SEAN	HUDGENS	Extra Copie	s To:		AsureQuality Limited	
Email:* SEAN.HUDGE	J				Wellington Laboratory	
Contact Phone No.:* 022 (	_	1 '	h sample separately?*	; [] 11	1C Quadrant Drive, Waiwhetu Lower Hutt 5010	1
Address:	0000012		nples are listed below, tick yes  Yes  ndividual CoA for each sample.	□ No	New Zealand	
		Sample Ser	nt By (Name):*REBECCA JOYCE	Signed By:*	Tel: +64 4 570 8359	alita a a ua
			Dispatched:		Email: GracefieldSR@asurequ	ality.com
			ample(s) dispatched in:	ient 🗏 Chilled 🗆 Frozen	Urgency Details*	/TAT\
		1	ine (Include a copy of the MPI Import Permit/		■ Normal Turn-around-time	
Submission Ref.: TRC-	PFAS-2018	1	ample(s) after analysis (Courier fees appl as will be discarded/returned 8 weeks after rep		☐ Half quoted TAT (50% surcha	
Purchase Order No.:	ļ.		oosite samples?	(S-4)	☐ Quarter quoted TAT (100% s	
Contract/Quote No.: 78	i		s hazardous to health?*	□No	NOTE: For urgent testing, please contact	
Contract/Quote No.: 75	<u>C</u>	Water sam	ples submitted?*	ble Non-Potable	submitting samples to confirm availabilit	
Sample Name* (unique sample identifier)	Sample Type (Type of product/substance E.y., Potable Water, Soll, Blotu Pro	/material duct, Apple, Cow	Sample Description (additional sample information, to appear or	Sampled Date (used to determine holding time, if applicable)	Testing Requirements* (test or compounds to be tested for)	AQ Ref.
GND 2285	Elver, Apple, Honey, Soil			6/8/18	DX-PFCS01	DE LE
GND 26 77						
6ND 2740				` ,		
GND 0508	<b>√</b>					
SWO 1	LEACHATE W		- LANDFILL	7/8/18		
QAQCOI	GROUND WA	TER		6/8/18		
aAQCO2	1					
QAQCO3	<b>*</b>			<b>↓</b>		
QARCO 4	LEACHATE WA	t7EK	- CANDFILL	7/8/18	1	
Required information						
Comments/Additional Info	ormation:			leceived By (Name):* igned By:*	Receipt Detail	5
Seua Data: Eabruan, 2018			Page 1 of 7	DEO TO CODITION	a. Attachased	Bl-, CD 027/4

QA Controlled Document

SAMPLES.

QAQCOS	LEACHATE WATER	-LAND FILL	7/8/18	DX- PFCSOI
Q1QC 06	CEARNATE WATER	- QAOL	1	
BBOI	BIOBOOST' GARDEN FERTILISER PRODUCT	HEAT-TREATED BIGSOLIDS - COMMERCIAL	7/8/18	TBC (contact sean.hudgens
ISW02	CEACHATE WATER	COMPOST	7/9/10	(confact sean.magers  eaccom.com)
16ND 1723	GROUND WATER		7/8/18 6/8/18	DX-PFCSO1



AsureQuality Limited | 1C Quadrant Drive | Waiwhetu | Lower Hutt 5010 | Wellington | New Zealand PO Box 31242 | Lower Hutt 5040 | Wellington | New Zealand t. +64 4 570 8800 | e. cswellington@asurequality.com | w. www.asurequality.com | Global Experts in Food Assurance

Certificate of Analysis

Submission Reference: TRC PFAS 2018

Final Report

New Zealand

Sean Hudgens
AECOM Consulting Services - Wellington
PO Box 27277
Wellington 6141
New Zealand

PO Number: 73494

Submitted by:
Taranaki Regional Council

Private Bag 713

Stratford 4352

Report Issued: 19-Sep-2018 AsureQuality Reference: 18-201031 Sample(s) Received: 08-Aug-2018 08:00

# Results

The tests were performed on the samples as received.

Customer Sample Name: WW01 AsureQuality ID: 18-201031-1 Sample Description: Effluent Sample Sample Condition: Acceptable Sampled Date: 07-Aug-2018 Unit **Method Reference** Result Poly- and Perfluorinated Alkyl Substances (PFAS) in Water Perfluoroalkylsulfonic acids **PFPrS** < 0.0010 AsureQuality Method (LC-MS/MS) μg/L PFBS 0.0054 AsureQuality Method (LC-MS/MS) μg/L PFPeS < 0.0010 μg/L AsureQuality Method (LC-MS/MS) di-PFHxS (1) < 0.0010 μg/L AsureQuality Method (LC-MS/MS) mono-PFHxS (1) <0.0010 AsureQuality Method (LC-MS/MS) µg/L L-PFHxS (1) 0.0023 μg/L AsureQuality Method (LC-MS/MS) Total PFHxS (3) 0.0023 AsureQuality Method (LC-MS/MS) μg/L PFHpS <0.0010 μg/L AsureQuality Method (LC-MS/MS) di-PFOS (5) <0.0010 AsureQuality Method (LC-MS/MS) μg/L mono-PFOS (5) 0.0010 μg/L AsureQuality Method (LC-MS/MS) L-PFOS (5) < 0.0010 μg/L AsureQuality Method (LC-MS/MS) Total PFOS (7) 0.0010 AsureQuality Method (LC-MS/MS) μg/L Sum PFHxS+PFOS (1) 0.0033 AsureQuality Method (LC-MS/MS) µg/L **PFNS** <0.0010 µg/L AsureQuality Method (LC-MS/MS) AsureQuality Method (LC-MS/MS) **PFDS** < 0.0010 μg/L Perfluoroalkylcarboxylic acids PFBA NR AsureQuality Method (LC-MS/MS) μg/L **PFPeA** 0.0028 μg/L AsureQuality Method (LC-MS/MS) **PFHxA** 0.0082 AsureQuality Method (LC-MS/MS) μg/L **PFHpA** 0.0014 μg/L AsureQuality Method (LC-MS/MS) **PFOA** 0.0040 μg/L AsureQuality Method (LC-MS/MS) **PFNA** AsureQuality Method (LC-MS/MS) < 0.0010 µg/L **PFDA** < 0.0010 μg/L AsureQuality Method (LC-MS/MS) PFUnDA <0.0010 AsureQuality Method (LC-MS/MS) μg/L **PFDoDA** <0.025 AsureQuality Method (LC-MS/MS) µg/L PFTrDA < 0.025 AsureQuality Method (LC-MS/MS) µg/L

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
PFTeDA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	NR	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	NR	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	64	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	103	%	AsureQuality Method (LC-MS/MS)
M4PFBA	NR	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	63	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	88	%	AsureQuality Method (LC-MS/MS)
MPFHpA	109	%	AsureQuality Method (LC-MS/MS)
M8PFOA	120	%	AsureQuality Method (LC-MS/MS)
M9PFNA	134	%	AsureQuality Method (LC-MS/MS)
M6PFDA	124	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	125	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	159 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	277 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	82	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	77	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	75	%	AsureQuality Method (LC-MS/MS)
			, , ,
DNEtFOSAA	186 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	205 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	118	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	NR	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	NR	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	NR	%	AsureQuality Method (LC-MS/MS)
R = Recovery outside method limits			
bcontracted Tests			
Gamma Irradiation	Complete		Subcontracted to MSD Animal Health Upper Hutt
stomer Sample Name: WW02			AsureQuality ID: 18-20103
mple Description: Influent Sample			
ample Condition: Acceptable	Sampled Date: 07-Aug-2018		
Test	Result	Unit	Method Reference
ly- and Perfluorinated Alkyl Substances (PFAS	i) in Water - High Level		
Perfluoroalkylsulfonic acids	,		
	<0.10		

Test	Result	Unit	Method Reference
PFBS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<20	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols	-1.0		Assert Oscalita Mathead (LO MO/MO)
NEtFOSE-M NMeFOSE-M	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids 4:2 FTS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards		F-9-	
M3PFBS	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	105	%	AsureQuality Method (LC-MS/MS)
M4PFBA	101	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	108	%	AsureQuality Method (LC-MS/MS)
MPFHpA	109	%	AsureQuality Method (LC-MS/MS)
M8PFOA	108	%	AsureQuality Method (LC-MS/MS)
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Test	Result	Unit	Method Reference
M9PFNA	109	%	AsureQuality Method (LC-MS/MS)
M6PFDA	116	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	112	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	110	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	123	%	AsureQuality Method (LC-MS/MS)
MPFOSA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	111	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	105	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	117	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	122	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	115	%	AsureQuality Method (LC-MS/MS)
bcontracted Tests			
Gamma Irradiation	Complete		Subcontracted to MSD Animal Health Upper Hutt

# **QC** Results

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Relates to sample(s) 18-201031-1

est	Result	Result Unit Method Reference	
oly- and Perfluorinated Alkyl Substances (PFAS)	in Water		
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)

Report Number: 1241691

est	Result	Unit	Method Reference
PFUnDA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	μg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	115	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	112	%	AsureQuality Method (LC-MS/MS)
M8PFOS	113	%	AsureQuality Method (LC-MS/MS)
M4PFBA	125	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	114	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	121	%	AsureQuality Method (LC-MS/MS)
MPFHpA	115	%	AsureQuality Method (LC-MS/MS)
M8PFOA	119	%	AsureQuality Method (LC-MS/MS)
M9PFNA	117	%	AsureQuality Method (LC-MS/MS)
M6PFDA	114	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	106	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	98	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	136	%	AsureQuality Method (LC-MS/MS)
MPFOSA	118	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	119	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	134	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	120	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	131	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	123	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	133	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	120	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	130	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	126	%	AsureQuality Method (LC-MS/MS)

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Relates to sample(s) 18-201031-2

st	Result	Unit	Method Reference
y- and Perfluorinated Alkyl Substances (PFAS) in W	Vater - High Level		
Perfluoroalkylsulfonic acids			
PFPrS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<5.0	μg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<20	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols		r <del>y</del>	·
NEtFOSE-M	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<1.0	μg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids		r <del>y</del>	·
4:2 FTS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	μg/L	AsureQuality Method (LC-MS/MS)

Internal Standards			
M3PFBS	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	102	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	104	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	104	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	109	%	AsureQuality Method (LC-MS/MS)
MPFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	107	%	AsureQuality Method (LC-MS/MS)

# **Analysis Summary**

# **Wellington Laboratory**

Analysis	Method	Accreditation	Authorised by	
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water				
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Cameron Evans	

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Report Number: 1241691

AsureQuality Reference: 18-201031 Report Issued: 19-Sep-2018

Analysis Method Accreditation Authorised by

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level

DX-PFCS01, 05-HIGHLEVEL AsureQuality Method (LC-MS/MS) IANZ Cameron Evans

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

# MSD Animal Health Upper Hutt, Upper Hutt (Subcontracted)

33 Whakatiki St, Trentham | Upper Hutt 5018 | New Zealand

Analysis Method Accreditation

**Gamma Irradiation** 

SC-GAMA01, 01-DEFAULT Subcontracted to MSD Animal Health Upper Hutt NA - Subcontracted

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable

Comer Even

**Cameron Evans** 

Scientist

# Accreditation

Report Number: 1241691



AsureQuality Reference: 18-201031 Report Issued: 19-Sep-2018

# **Appendix**

# **Analyte LOR Summary**

Poly- and Perfluorinated Alky	d Substances (PFAS) in Water	<ul> <li>AsureQuality Method (LC-MS/MS)</li> </ul>

Analyte LOR (µg/L)

Listing applies to samples: 18-201031-1

Perfluoroalkylsulfonic acids

PFPrS 0.0010 PFBS 0.0010 PFPeS 0.0010 di-PFHxS (1) 0.0010 mono-PFHxS (1) 0.0010 L-PFHxS (1) 0.0010 Total PFHxS (3) 0.0010 PFHpS 0.0010 di-PFOS (5) 0.0010 mono-PFOS (5) 0.0010 L-PFOS (5) 0.0010 Total PFOS (7) 0.0010 Sum PFHxS+PFOS (1) 0.0010 **PFNS** 0.0010 PFDS 0.0010

Perfluoroalkylcarboxylic acids

PFBA NR PFPeA 0.0010 PFHxA 0.0010 PFHpA 0.0010 PFOA 0.0010 PFNA 0.0010 PFDA 0.0010 PFUnDA 0.0010 PFDoDA 0.0010 PFTrDA 0.0010 PFTeDA 0.0010

Perfluorooctanesulfonamides

 PFOSA
 0.0010

 NEtFOSA-M
 0.0010

 NMeFOSA-M
 0.0010

Perfluorooctanesulfonamidoacetic acids

 NEtFOSAA
 0.0010

 NMeFOSAA
 0.0010

Perfluorooctanesulfonamidoethanols

 NEtFOSE-M
 0.0010

 NMeFOSE-M
 0.0010

Telomere Sulfonic acids

 4:2 FTS
 NR

 6:2 FTS
 NR

 8:2 FTS
 NR

# Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte LOR (µg/L)

Listing applies to samples: 18-201031-2

Perfluoroalkylsulfonic acids

•	
PFPrS	0.10
PFBS	0.10
PFPeS	0.10
di-PFHxS (1)	0.10
mono-PFHxS (1)	0.10
L-PFHxS (1)	0.10
Total PFHxS (3)	0.10
PFHpS	0.10
di-PFOS (5)	0.10
mono-PFOS (5)	0.10
L-PFOS (5)	0.10
Total PFOS (7)	0.10
Sum PFHxS+PFOS (1)	0.10
PFNS	0.10
PFDS	0.10
Perfluoroalkylcarboxylic acids	
PFBA	0.10
PFPeA	0.10
PFHxA	0.10

0.10 PFHpA 0.10 PFOA 0.10 PFNA 0.10 PFDA 0.10 PFUnDA 0.10 PFDoDA 0.10 PFTrDA 0.10 PFTeDA 0.10

## Perfluorooctanesulfonamides

 PFOSA
 0.10

 NEtFOSA-M
 0.10

 NMeFOSA-M
 0.10

# Perfluorooctanesulfonamidoacetic acids

NEtFOSAA 0.10 NMeFOSAA 0.10

# Perfluorooctanesulfonamidoethanols

NEtFOSE-M 0.10 NMeFOSE-M 0.10

# Telomere Sulfonic acids

 4:2 FTS
 0.10

 6:2 FTS
 0.10

 8:2 FTS
 0.10

# **Analyte Definitions**

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte Full Name

Listing applies to samples: 18-201031-1

Perfluoroalkylsulfonic acids

PFPrS Perfluoro-1-propanesulfonic acid

PFBS Perfluoro-1-butanesulfonic acid
PFPeS Perfluoro-1-pentanesulfonic acid

 di-PFHxS (1)
 Total Perfluorodimethylbutane sulfonic acids

 mono-PFHxS (1)
 Total Perfluoromethylpentane sulfonic acids

 L-PFHxS (1)
 Linear Perfluorohexanesulfonic acid

 PFHpS
 Perfluoro-1-heptanesulfonic acid

di-PFOS (5)

Total Perfluorodimethylhexane sulfonic acids mono-PFOS (5)

Total Perfluoromethylheptane sulfonic acids L-PFOS (5)

Linear Perfluoroctanesulfonic acid

PFNS

Perfluoro-1-nonanesulfonic acid

PFDS

Perfluoro-1-decanesulfonic acid

# Perfluoroalkylcarboxylic acids

PFBA Perfluoro-n-butanoic acid PFPeA Perfluoro-n-pentanoic acid PFHxA Perfluoro-n-hexanoic acid PFHpA Perfluoro-n-heptanoic acid PFOA Perfluoro-n-octanoic acid PFNA Perfluoro-n-nonanoic acid PFDA Perfluoro-n-decanoic acid PFUnDA Perfluoro-n-undecanoic acid PFDoDA Perfluoro-n-dodecanoic acid PFTrDA Perfluoro-n-tridecanoic acid PFTeDA Perfluoro-n-tetradecanoic acid

#### Perfluorooctanesulfonamides

PFOSA Perfluoro-1-octanesulfonamide

NEtFOSA-M N-ethylperfluoro-1-octanesulfonamide

NMeFOSA-M N-methylperfluoro-1-octanesulfonamide

# Perfluorooctanesulfonamidoacetic acids

 NEtFOSAA
 N-ethylperfluoro-1-octanesulfonamidoacetic acid

 NMeFOSAA
 N-methylperfluoro-1-octanesulfonamidoacetic acid

# Perfluorooctanesulfonamidoethanols

 NEtFOSE-M
 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol

 NMeFOSE-M
 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

## Telomere Sulfonic acids

4:2 FTS 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid

# Internal Standards

M3PFBS Perfluoro-1-[2,3,4-13C3]butanesulfonic acid M3PFHxS Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid M8PFOS Perfluoro-1-[13C8]octanesulfonic acid M4PFBA Perfluoro-n-[1,2,3,4-13C4]butanoic acid M5PFPeA Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid M5PFHxA Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid MPFHpA Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid M8PFOA Perfluoro-n-[13C8]octanoic acid M9PFNA Perfluoro-n-[13C9]nonanoic acid

M6PFDA Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA N-methyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA N-methyl-D3-perfluoro-1-octanesulfonamide

DNEtFOSAA
N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid

DNMeFOSAA
N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid

DNEtFOSE
2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol

DNMeFOSE
2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol

M4:2FTS
1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid

M6:2FTS
1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

## Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte Full Name

Listing applies to samples: 18-201031-2

Perfluoroalkylsulfonic acids

PFPrS Perfluoro-1-propanesulfonic acid
PFBS Perfluoro-1-butanesulfonic acid
PFPeS Perfluoro-1-pentanesulfonic acid

di-PFHxS (1)

Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)

Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)

Linear Perfluorohexanesulfonic acid

PFHpS

Perfluoro-1-heptanesulfonic acid

di-PFOS (5)

Total Perfluorodimethylhexane sulfonic acids mono-PFOS (5)

Total Perfluoromethylheptane sulfonic acids L-PFOS (5)

Linear Perfluoroctanesulfonic acid

PFNS

Perfluoro-1-nonanesulfonic acid

PFDS

Perfluoro-1-decanesulfonic acid

Perfluoroalkylcarboxylic acids

PFBA Perfluoro-n-butanoic acid PFPeA Perfluoro-n-pentanoic acid PFHxA Perfluoro-n-hexanoic acid PFHpA Perfluoro-n-heptanoic acid PFOA Perfluoro-n-octanoic acid PFNA Perfluoro-n-nonanoic acid PFDA Perfluoro-n-decanoic acid PFUnDA Perfluoro-n-undecanoic acid PFDoDA Perfluoro-n-dodecanoic acid PFTrDA Perfluoro-n-tridecanoic acid PFTeDA Perfluoro-n-tetradecanoic acid

Perfluorooctanesulfonamides

PFOSA Perfluoro-1-octanesulfonamide

NEtFOSA-M N-ethylperfluoro-1-octanesulfonamide

NMeFOSA-M N-methylperfluoro-1-octanesulfonamide

Perfluorooctanesulfonamidoacetic acids

 NEtFOSAA
 N-ethylperfluoro-1-octanesulfonamidoacetic acid

 NMeFOSAA
 N-methylperfluoro-1-octanesulfonamidoacetic acid

Perfluorooctanesulfonamidoethanols

 NEtFOSE-M
 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol

 NMeFOSE-M
 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

Telomere Sulfonic acids

4:2 FTS 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid

Internal Standards

M3PFBS Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA Perfluoro-n-[1,2,3,4-13C4]butanoic acid

AsureQuality Reference: 18-201031 Report Issued: 19-Sep-2018

Analyte	Full Name
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid

1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

M4:2FTS

M6:2FTS

M8:2FTS

Report Number: 1241691



Issue Date: February 2018

# AsureQuality Food and Environmental Submission Form/Chain of Custody

						T	
Customer Details Reporting Details					AQ Project Reference		
Company Name:* AECO	M NZ LTD	Report Results To:* SEAN.HUDGENS@AECOM.COM			TAD USE (DIVI)		
Contact Person:* SEAN HUDGENS		Extra Copies To:			AsureQuality Limited		
Email:* SEAN.HUDGE						Wellington Laboratory	
Contact Phone No.:*022		Report each sample separately?*  If multiple samples are listed below, tick yes to receive an individual CoA for each sample.  Sample Sent By (Name):* REBELLA JOYCESigned By:*				1C Quadrant Drive, Waiwhetu Lower Hutt 5010	
Address:	000 00 12					New Zealand Tel: +64 4 570 8359	
Address.							
				Jigned D	71.	Email: GracefieldSR@asurequa	ality.com
		Date/Time	Dispatched: ample(s) dispatched in:	☐ Ambient	☐ Chilled ☐ Frozen	Urgency Details*	
			ine (include a copy of the MPI)			■ Normal Turn-around-time (TAT)	
		☐ Return sample(s) after analysis (Courier fees apply)  NOTE: Samples will be discarded/returned 8 weeks after reporting unless otherwise instructed.				☐ Urgent Service (please select from options below) ☐ Half quoted TAT (50% surcharge)	
Submission Ref.: TRC-	PAS-2018						
Purchase Order No.: 784 7 34 94, Contract/Quote No.: 78 C		AQ to composite samples?  Are samples hazardous to health?*  Water samples submitted?*  Dyes  No  No  No-Potable		☐ Quarter quoted TAT (100% surcharge)  NOTE: For urgent testing, please contact AQ prior to submitting samples to confirm availability.			
						Sample Name* (unique sample identifier)	Sample Type (Type of product/substance E.g., Potable Water, Soll, Blota Pro
WWOI	WASTEWATE		EFFLUENT	JAMPLE	7/8/18	DX-PFCS01	114
WWOZ	WASTE WAT	ER	INPLUENT	JAMPLE	1	4	219
						<u> </u>	
Required information	f			Bassiner	By (Name): * K. Chember	am la	
Comments/Additional Ir	ntormation:			Signed B	• •	8:00am NZ Couriers 08/08/18	

Page 1 of 1 **QA Controlled Document**  Attachment No: SR-033/1

LBA 09800897